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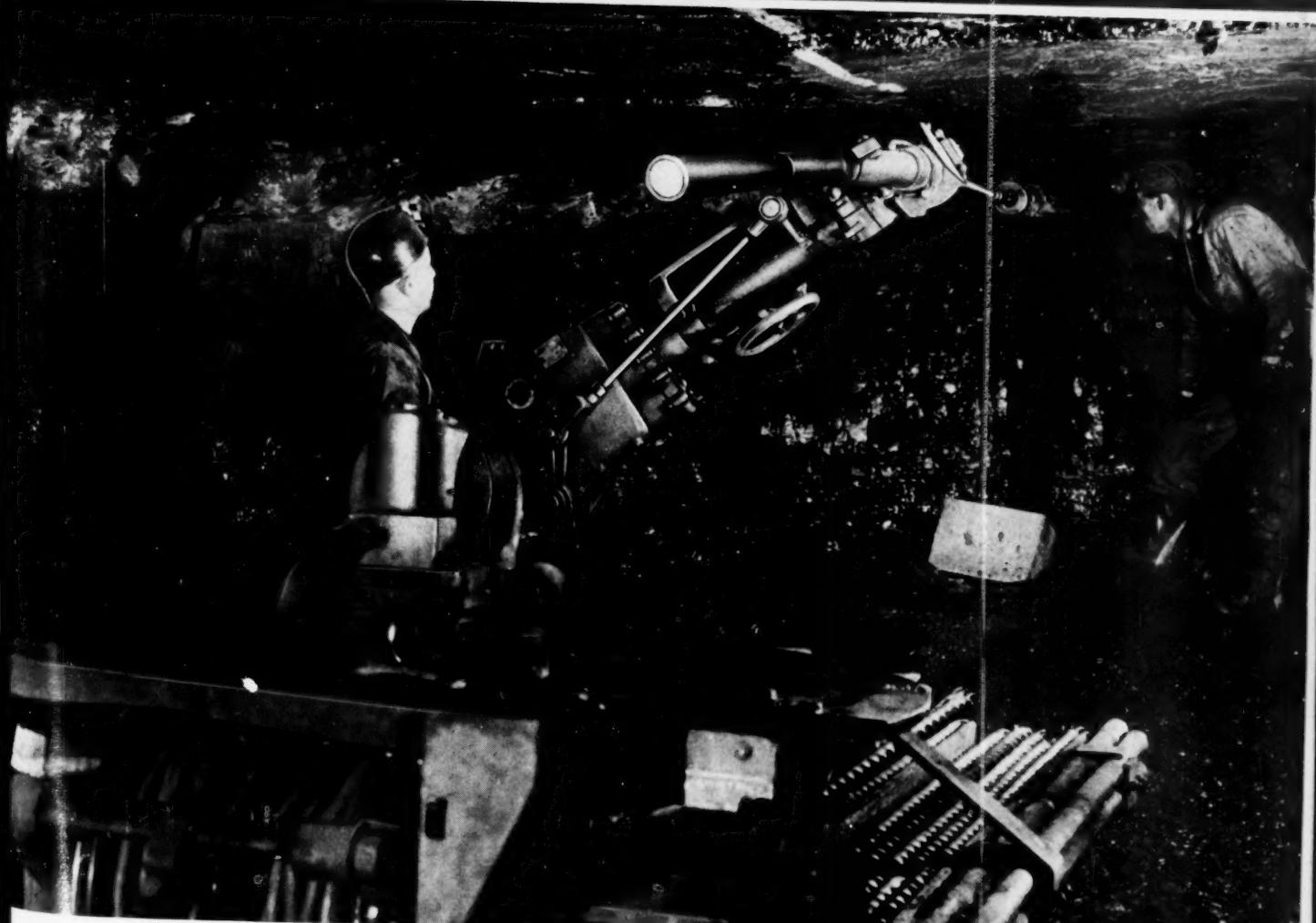
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Coal Age

JANUARY, 1944



HOW TO REDUCE ABSENTEEISM

POWER DRAG "Flagged"!

SUN MINE LUBRICANTS

Eliminate Caking Grease... Speed Movement of Cars

Any slow-down in mine car movement is a "slow-down" in vitally needed coal production. Sun Lubricants are helping to keep the wheels of the coal industry rolling under all kinds of difficult conditions. In one recent case, cars equipped with roller bearings had been lubricated with a competitive grease.

Power drag almost stopped cars on a 15% grade! A Sun Engineer, called in to investigate, discovered that the grease being used was separating and leaving a hard cake of soap which acted as a brake. He recom-

mended changing to a Sun Mine Car Grease.

Drag disappeared entirely as soon as the switch in lubricants was made... and has never recurred in the 15 months since the change-over. Wheels roll freely and no difficulty is experienced in making the grade with loaded cars.

A 20% saving in lubrication costs was also effected by the change!

A Sun Engineer will be glad to study your lubrication problems and make specific recommendations for their solution. Write to

SUN OIL COMPANY • Philadelphia 3, Pa.
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SUN INDUSTRIAL PRODUCTS

HELPING INDUSTRY HELP AMERICA

► **SUNOCO** ▶

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COAL A



Photo Courtesy of California and Hawaiian Sugar Refining Corp. Ltd.

Every 33 seconds — a lifetime sugar ration

A typical example of B. F. Goodrich improvement in rubber

IT TAKES that big conveyor only 33 seconds to get all the sugar you'll probably use for life — 7,000 pounds from ship to shore. This is the new and better way to load and unload sugar — time is saved, ships are released sooner.

But in order to let the conveyor system move up and down, in and out — to cover the entire ship load — the belts had to be telescoped one over the other, and telescoped belts meant there was only room enough for 14-inch pulleys. An ordinary conveyor belt heavy enough to do the job would soon be ruined if used on pulleys that small.

Some kind of belt was needed that would be very flexible but still strong enough to carry the heavy loads of sugar month after month.

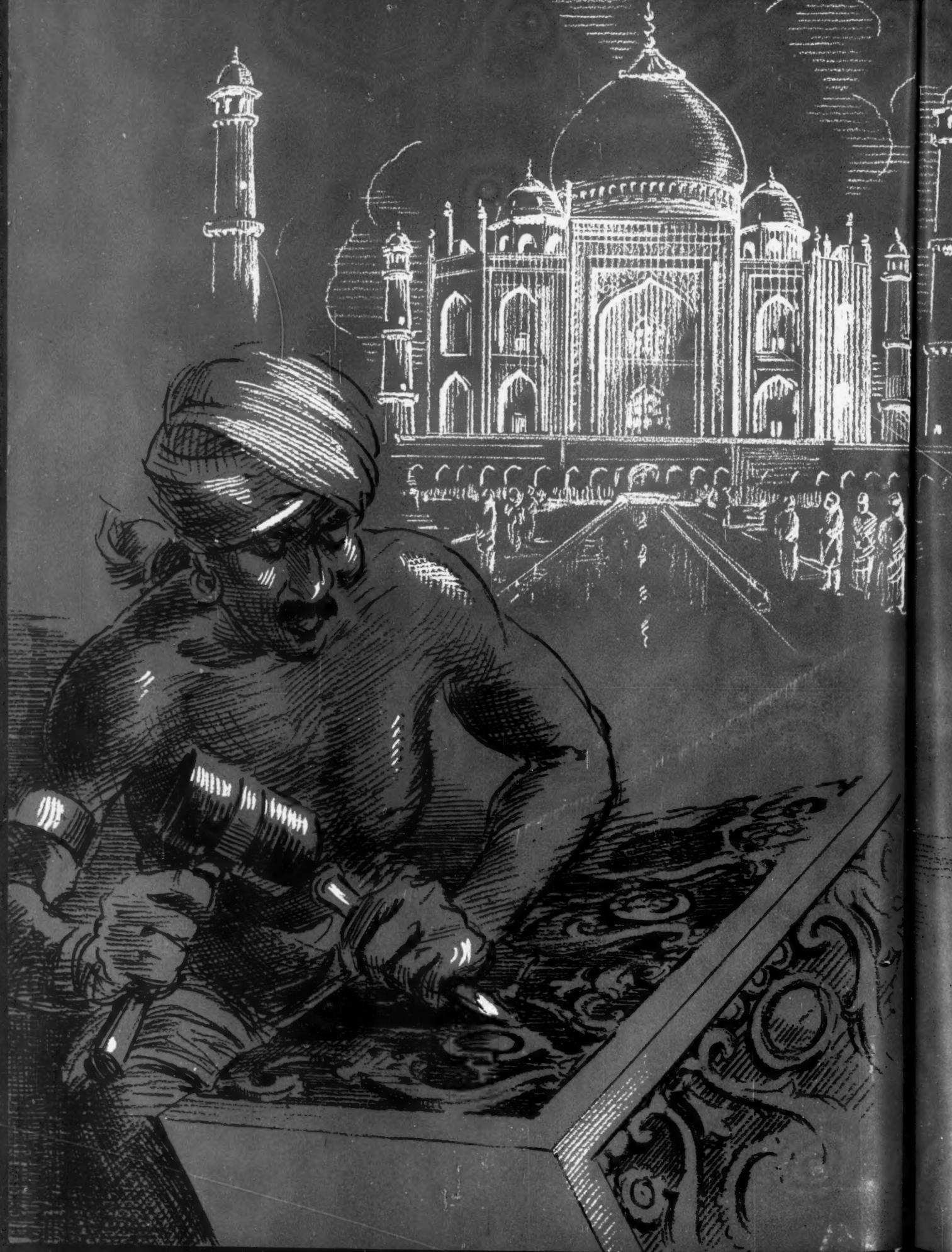
B. F. Goodrich had developed a belt made of cords, running parallel and held in place only by the rubber, not woven together as in ordinary belts. It had been designed to stand heavy falling rocks; the cords could spread apart under the shock and give the effect of more cushion. But it was flexible and strong enough to be used with fewer plies. This new kind of belt was tried on the small pulleys. It travelled around them easily, has

helped make this modern loading method a success.

B. F. Goodrich engineers have developed scores of different types of conveyor belts to meet special conditions, and to give longer life and better service on standard installations, too. Don't be satisfied that any rubber product you have is the best you can find, until you have seen whether B. F. Goodrich has developed an improvement over it. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.* 

B. F. Goodrich
RUBBER and SYNTHETIC products

TO DO ONE THING



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In all the world, no structure created by man rivals the Taj Mahal at Agra, India, built by Emperor Shah-Jahan in memory of his favorite wife. In beauty of design and richness of decorative detail it is the one supreme achievement of its kind . . . HULBURT, too, over a period of 25 years, has achieved one supreme product, for one specific purpose, unrivaled in its performance . . . HULBURT Quality Grease, made solely for lubricating coal mine equipment.

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PHILADELPHIA, PENNSYLVANIA



HULBURT
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GREASE



**FOR GATHERING OR FOR MAIN LINE HAULAGE,
YOU'LL GET OUT GREATER TONNAGE WITH**

HEAVY-DUTY PHILCO BATTERIES



Powered with heavy duty Philco Batteries, your mine locomotives will handle more tons per shift... and do it consistently! In hundreds of mines Philco Batteries are keeping production at peak figures because every Philco is engineered to deliver *sustained* high voltage...designed to give you the power to pick up a long trip of loaded cars, haul it away and have the empties back in record time!

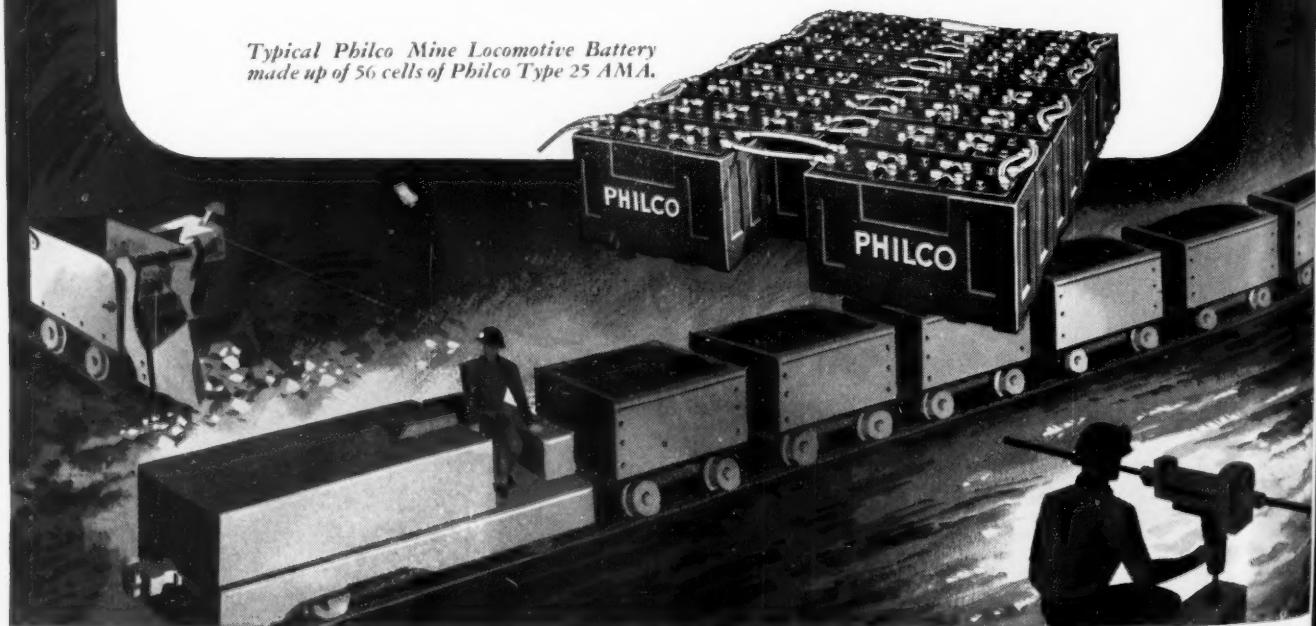
You get this extra wallop from a Philco for two reasons. First, because the design of the Philco grid provides high electrical efficiency and superior conductivity. Second, because the Philco "K" Process of dehydration produces an exceptionally porous plate with a tighter bond between active material and grid.

Only in a Philco do you get these two important battery features!

For complete information and engineering specifications, write for the Philco Mine Battery catalog. *Philco Corporation, Storage Battery Division, Trenton 7, New Jersey.*

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MINE
BATTERIES

*Typical Philco Mine Locomotive Battery
made up of 56 cells of Philco Type 25 A.M.A.*



Coal Age

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 Louis C. McCarthy Fred W. Richart
 James R. Sutphen Paul Wooton
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FROM

To

SIGNED



EDISON ALKALINE BATTERY *SURVIVES FIRE & FLOOD*

*News from the Far North for Users
of Mine Locomotives and Shuttle Cars . . .*

ADVANTAGES OF THE EDISON ALKALINE BATTERY FOR MINE LOCOMOTIVES AND SHUTTLE CARS

- ★ It is durable mechanically. High strength steel construction is used in the containers, grids, pole pieces, etc. The electrolyte is a preservative of steel.
- ★ It is foolproof electrically. It may be accidentally short-circuited, over-charged, over-discharged, or even charged in the reverse direction without injury.
- ★ It can be charged rapidly. It does not require critical adjustment of charge rates and, therefore, can be charged directly from the d-c mine power supply. It has no finish-rate limitations. It requires no equalizing.
- ★ It withstands temperature extremes. It is not damaged by freezing. Free air spaces on all sides of all cells provide ventilation for rapid cooling under high temperature conditions.
- ★ It is simple to maintain. Merely charge adequately, add pure water, keep clean and dry.
- ★ Its tray assembly and cell connections are extremely simple.
- ★ Its life is so long that its annual depreciation cost is lower than that of any other type of storage battery.

When a coal mine in Alaska caught fire recently, a 10-year-old Edison Alkaline Battery on a locomotive was trapped in the fire area. After the mine was flooded to put out the fire, the locomotive remained under water for nearly two months before it could be recovered.

When the battery was inspected, the tops of several cells were found to have been damaged by fire, but this was the only visible injury and required only minor repairs. Then the battery was given an electrical test. It delivered full rated capacity.

Although Edison Alkaline Batteries are not bought to withstand such abuse, the fact that they often do, in mines, railroads and industry, serves to demonstrate the great reserve of dependability which they have available under all conditions.

Some of the unique characteristics which account for the long life and dependability of the Edison Alkaline Battery are cited in the column at the left.

EDISON STORAGE BATTERY DIVISION, THOMAS A. EDISON, INCORPORATED, WEST ORANGE, NEW JERSEY

Edison
ALKALINE BATTERIES

BLAST HOLE DRILLING TOOLS

Designed FOR EVERY TYPE OF JOB ...

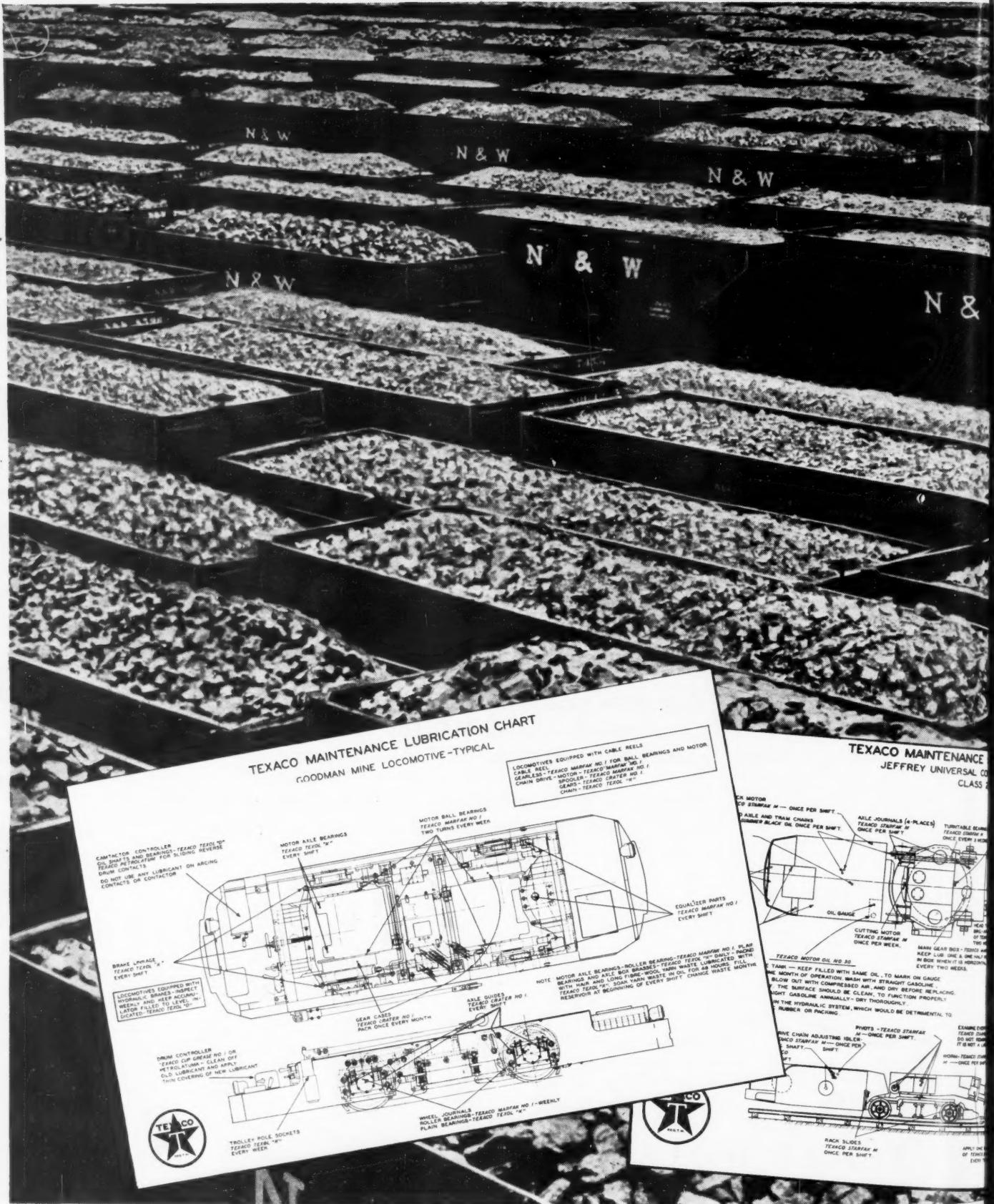
COALMASTER Drilling Tools are designed and used primarily to reduce production costs. This result is achieved by quality materials, lighter weight and complete rigidity, accurate alignment, lower power cost, less bit breakage, minimum auger wear, and smooth vibrationless operation.

COALMASTER Equipment delivers maximum value when used in "complete matched sets."

Just state explosive type and size and hole diameter desired — COALMASTER provides a drilling assembly to match.

Our field technicians are ready and eager to help you without cost or obligation. Tell us when and where.





TEXACO

Lubricants

Getting Set FOR A TERRIFIC 1944

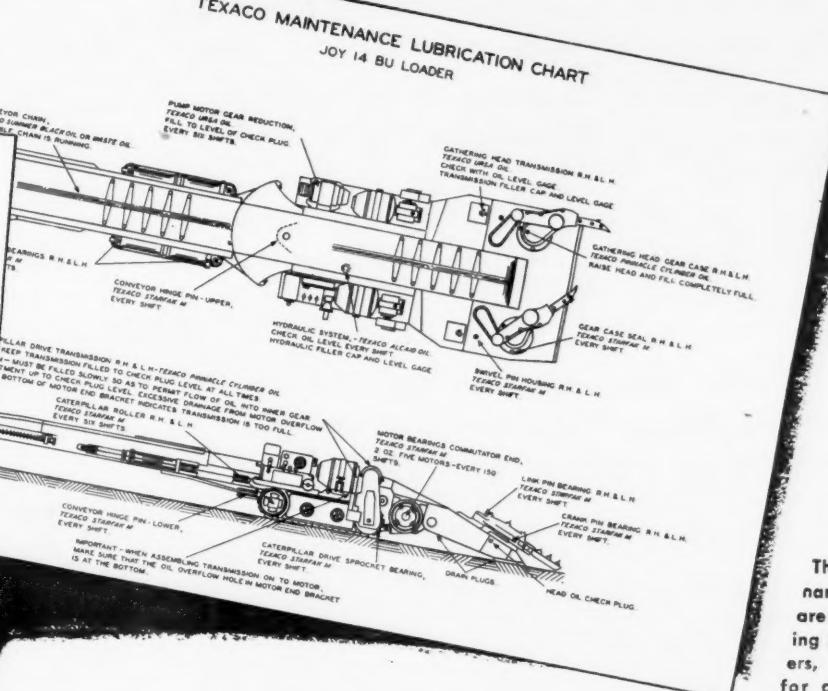
REMENDOUS events on land, sea and in the air are promised for the new year... and tremendous efforts expected from the coal mining industry, to meet the Government's request for 685 million tons.

Few things in the mining of coal will contribute more to the accomplishment of this great task than Texaco Maintenance Lubrication Charts, which show exactly where,

when and with what lubricant to service cutters, loaders, locomotives, etc.

Texaco Olympian Greases for cutters, loaders, and particularly mine car wheels, assure easier starting, longer-lasting bearings, and less time out for repair.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States. The Texas Company, *National Sales Division*, Dept. C, 135 East 42nd Street, New York 17, N. Y.



These Texaco Maintenance Lubrication Charts are available for all leading makes of cutters, loaders, locomotives, etc. Ask for charts by make and model.

for the Coal Mining Industry

Keep Your Blasting Machines Dry, Handy . . . and Under Lock and Key

Save Time Increase Safety

Investigation of misfires shows that moisture is often at the bottom of the trouble—moisture that the blasting machine has picked up.

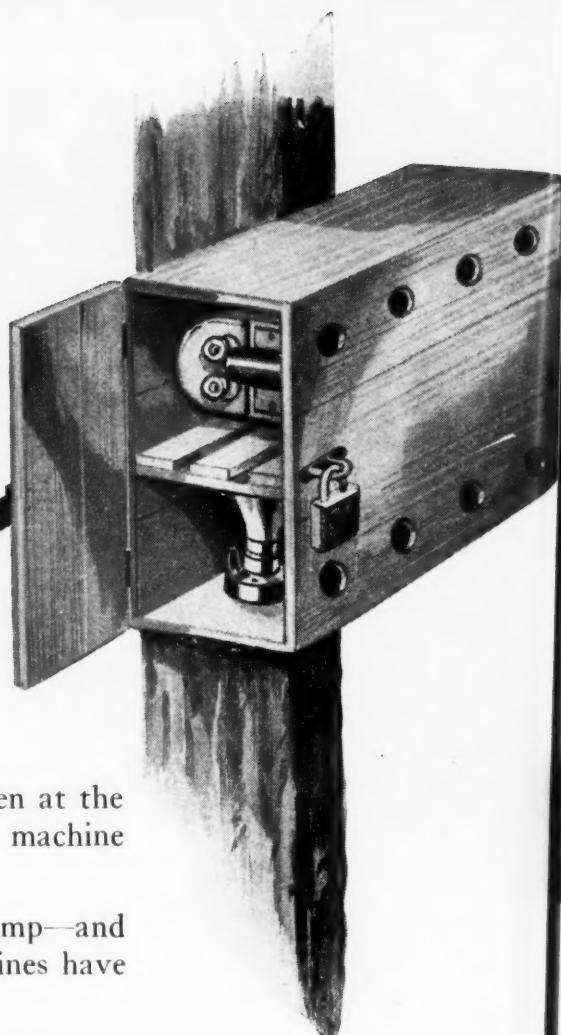
Blasting machines can't deliver full capacity when damp—and weak blasting machines can cause misfires. Some mines have devised a simple solution that increases safety:

The blasting machine is placed in a locked box, kept dry by a small electric light bulb—and located handy to the working places.

And if the leading wire you are using is not rubber covered, it can also be kept dry in the same box—thus reducing current leakage.

This is typical of the suggestions that the Atlas Technical Representative may make when he surveys your mine, as our knowledge and experience extends to all aspects of explosives and their use.

We would like to engage in Synergistic* thinking with you—it will assist you in getting "2 plus 2 equals 5" results in blasting. Consult Atlas.



***Synergism**—*The meeting of minds "clicking together" from the impact of ideas to give a result greater than the sum total of ideas expressed—a "2+2=5" result. Synergism is a big help toward making your equipment last longer.*

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY, Wilmington 99, Del. • Offices in principal cities • Cable Address—Atpow



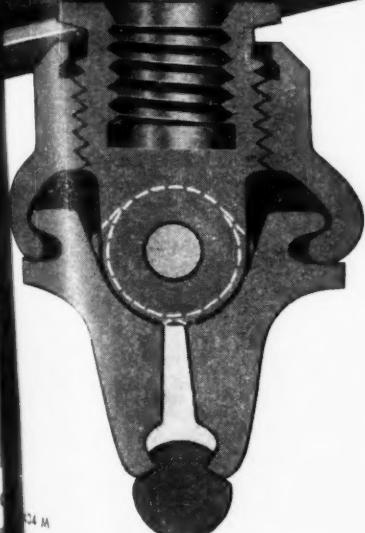
Three Points to Consider in Selecting Trolley Wire Clamps

1 COLLECTOR CLEARANCE
Do clamp jaws allow free passage of collector without arcing and burning?

2 RECLAIMABILITY
Is design corrosion-proof? Can clamp be used over and over again?

3 HOLDING POWER
Does clamp deliver gripping power with high ultimate yet easily regulated to suit individual requirements?

GET PROPER BALANCE OF ALL THREE REQUIREMENTS WITH
O-B BULLDOG TROLLEY CLAMP
NO ONE FEATURE HIGHLIGHTED AT EXPENSE OF OTHER TWO



• Cross-section of an O-B Bulldog. Note how the head-nut automatically controls the opening and closing of the clamp jaws. Accurate threads, uniformly galvanized, give maximum protection against corrosion; faster, easy reclaimability.



Ohio Brass
MANSFIELD, OHIO

Canadian Ohio Brass Co., Ltd., Niagara Falls, Ont.

KEEP BUYING WAR BONDS

meeting
" from
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of ideas
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toward
t longer.



What's your coal question?

That's what we asked you. Here are our answers to a few of your questions.

An accountant in Boston asks:

Are miners paid all they deserve considering the hazards of their work?

American coal mines are the safest in the world, and American coal miners are the best paid in the world. Moreover, coal miners' hourly earnings are higher than the average for all manufacturing industries. Fatal accidents in the mines have been reduced by approximately 40% in the past fifteen years, while the pay of miners has more than doubled. Progress in the development and installation of new mechanical safeguards never stops. Teaching miners themselves to be careful is part of a consistent, well organized safety program. Federal and state inspection is constantly going on. In the event of accident, miners and their families receive definite, specified compensation.



In war and in peace America depends on bituminous coal for most of its warmth, most of its electricity, most of its industrial power.

That makes it important for the public to know the real facts about this fuel, and about the people who mine it.

So we take this method of reporting to you.

And to make sure that we cover the subjects of greatest interest we have asked thousands of people what they most want to know about the coal industry and the way it is run.

On this page we present three questions asked over and over again. Next month we will present further questions and answers.

A garage mechanic in Nashville asks:

What kind of homes do miners live in today?

For the most part, miners live in homes as attractive and comfortable as those of any other well-paid workers. Washing machines, radios, refrigerators and other home appliances are commonly found in miners' homes. A miner is just as free to choose where or how he will live as anyone else. The automobile makes it possible for him to ride or drive to and from his place of employment like a worker in any other industry. When a miner lives in a company home, it is because he wants to. Today company homes on company property are usually better than the average home in the sections where they are located. Rents average around \$15 a month.



A New York policeman asks:

Are miners always "in hock" to company stores?

The answer is that they are not. And there is no reason why they should be. Most miners may draw against their pay any time they want to for taking care of their living expenses. They may trade at an independent store, a chain store or a company store. In a small mine in West Virginia, the pay roll figures show that only about 9 1/4% of the combined pay of all the 296 miners employed there was currently owed to the company store. Besides all this, the OPA forbids any store, and of course this includes company stores, to extend credit to any individual for more than 60 days. The only exception is credit for heavy consumer goods, and these would normally be financed on time payments anyway.



We are fully conscious of our responsibility as good citizens and good employers in the course of supplying America with its No. 1 fuel—and we consider answering your questions a part of that responsibility.

BUY MORE WAR BONDS

BITUMINOUS COAL
Institute

60 East 42nd Street

New York 17, N.Y.

January, 1944 • COAL AD



ROOM TO ENTRY

JEFFREY
UNDERGROUND
CONVEYORS





JEFFREY underground conveyors

reduce the cost of getting out coal—speed production.

17 standard units—chain or belt types—from which 54 combinations can be made—to meet all mining conditions. We can furnish the right conveyors—the technicians and engineers to coordinate your underground requirements into a smooth-running system. Catalog

No. 740-A.

FACE TO ROOM





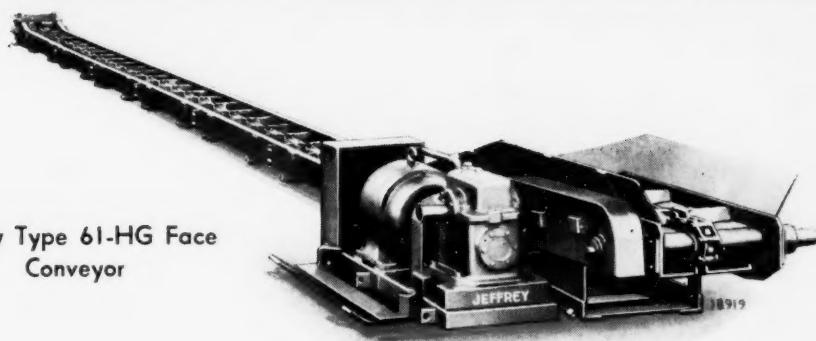
CONVEYORS

TO THE FRONT IN THIN SEAM MINING

COAL FOR WAR

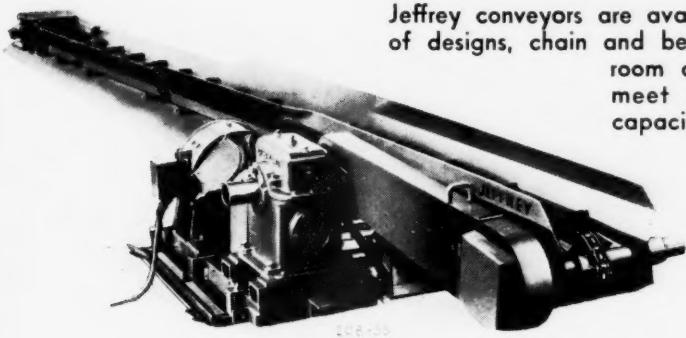
COAL PRODUCES 55% OF THE COUNTRY'S
TOTAL ELECTRIC NEEDS

*Use of underground conveyors has practically doubled
since 1939. 2393 in use in 1939. 4200 in use in 1942*



Jeffrey Type 61-HG Face
Conveyor

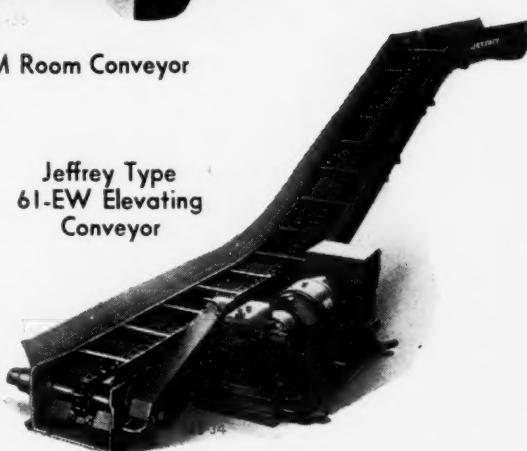
Jeffrey conveyors are available in a variety
of designs, chain and belt types for entry,
room and face work, to
meet every reasonable
capacity requirement.



Jeffrey Type 61-AM Room Conveyor

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- Durable materials
- Lightweight design to facilitate moving
- Dependable power equipment
- Economical operation and maintenance
- Safety to equipment and workman
- Simplified method of coupling sections

Jeffrey Type
61-EW Elevating
Conveyor



45 TONS
OF COAL
TO MAKE STEEL
FOR ONE MEDIUM
TANK



BUY
WAR
BONDS

RS
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TRY'S

ally doubled
use in 1942



45 TONS
OF COAL
TO MAKE STEEL
FOR ONE MEDIUM
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Jeffrey

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BELOW AND ABOVE GROUND
FROM FACE TO RAILROAD CAR

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LOADERS
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NEW TRAINING FILM FOR MAINTENANCE WORKERS

"PIPING POINTERS"

16 mm. Sound Movie

NOW READY
FOR FREE SHOWING
IN ANY PLANT

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TEACHES PROPER HANDLING OF VALVES, FITTINGS AND PIPE

TRAINING new workers in the fundamentals of piping maintenance becomes an easier task with this "Piping Pointers" sound film. It quickly familiarizes trainees with various types of valves and fittings and explains how to choose the most practical equipment for each use. It shows what to do when valves leak—how to handle many other maintenance problems—how to conserve time and critical materials. One complete section is devoted to the "Language of Piping."

Manual Makes This Film More Valuable

Making this film doubly effective is the new 32-page Crane "Piping Pointers" manual which takes up in greater detail each subject covered in the film. This is the most complete manual of its kind ever compiled by Crane—it's full of valuable "know-how" data for every piping man. And all the information given in both film and manual is fully dependable because it's based on Crane's own 88-year experience as the world's leading maker of valves and fittings.

Act Now to See This Film in Your Plant. Requests for the "Piping Pointers" film are coming in fast. Assure a convenient early showing in your plant. Get in touch soon with your local Crane Branch that will arrange for use of the film and provide a supply of manuals. If you prefer, use the coupon below and we'll have the Crane Branch contact you.

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Illinois.

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Made Entirely of

*SYNTHETIC Rubber

Have Been Wearing 2-Times to 3-Times as Long as ANY Natural Rubber Belt on Drives where Heat and Oil Conditions are Especially Severe!

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*A very special synthetic rubber was chosen by Gates. This synthetic had not been developed as merely a "substitute" for rubber. In certain important applications it is greatly superior to natural rubber. Under severe conditions of heat and oil, for example, the Gates special synthetic V-belt in hundreds of plants is actually outwear-

ing belts of natural rubber by as much as 230%!

This long record of success in making V-belts of synthetic rubber stands unrivaled in the rubber industry. No other maker of V-belts has had anything approaching Gates' experience and proved success in this field.

This is particularly important to you now. The time has come when Gates' superior "know-how" in the making of synthetic rubber V-belts can be put to work for you right in your own plant.

You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates' knowledge and experience without the slightest obligation.

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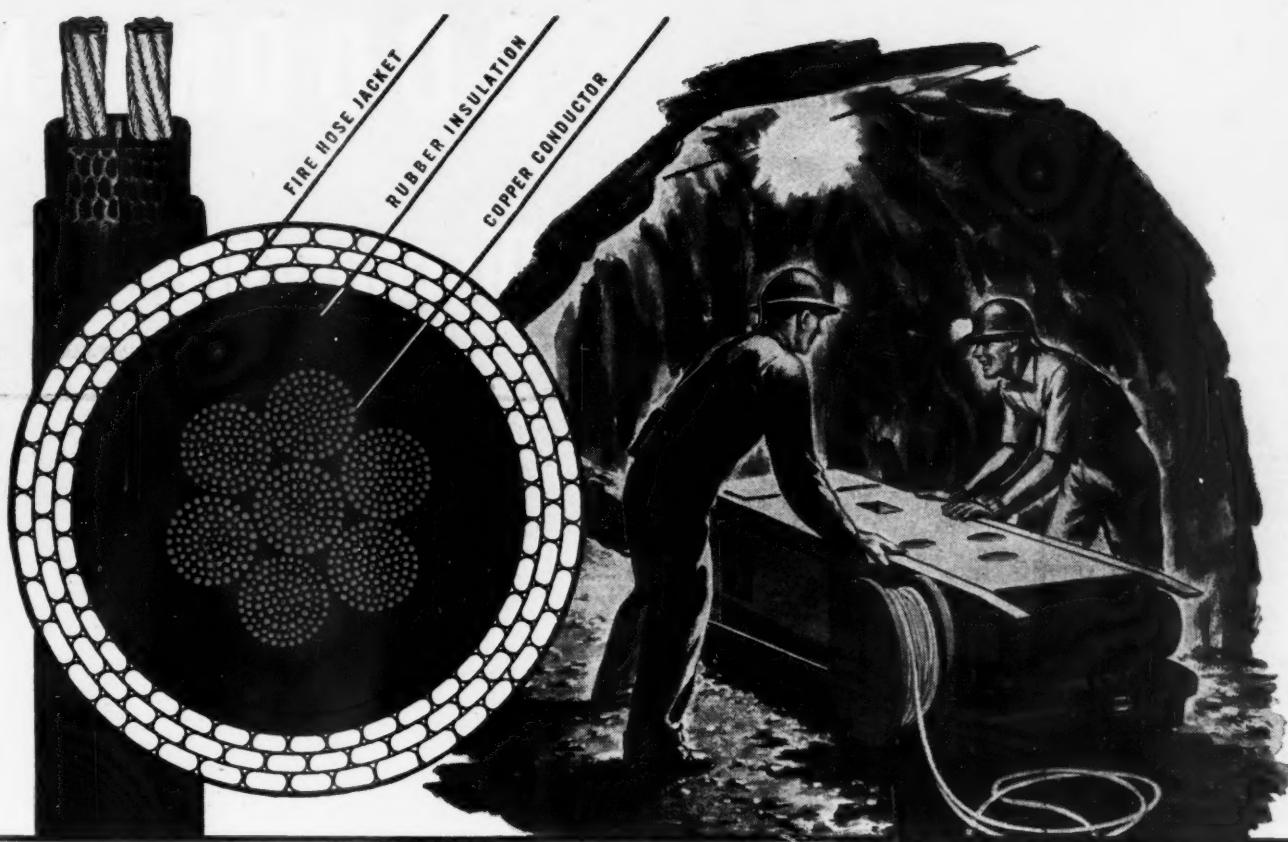
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Duracord saves up to 50% rubber in portable cables...has a better than 20-year service record

THERE is nothing "ersatz" about Duracord*; it is a cable construction developed during the last war to meet the need for heavy-duty cords and cables...a need it is *currently* filling not only in mines but also industrial plants and shipyards.

The Duracord covering is woven like a fire hose—not braided. This tough yet flexible cover

replaces the rubber jacket on all rubber cords making possible rubber savings as high as 50%.

For further information, please send us your inquiries.

SUNEX SECURITYFLEX* TO WAR
This well-known all-rubber

 
Two marks of achievement—the cherished Navy "E" (awarded to two of our plants) for achievement in production...The Anaconda trade-mark for achievement in quality.

companion to Duracord has been preempted for the toughest kind of jobs in the war effort where all-rubber cord is mandatory. Until peace, its use will be strictly regulated.

*Reg. U.S. Pat. Off.

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Sunex Securityflex and Duracord

ANACONDA WIRE & CABLE COMPANY

GOODMAN

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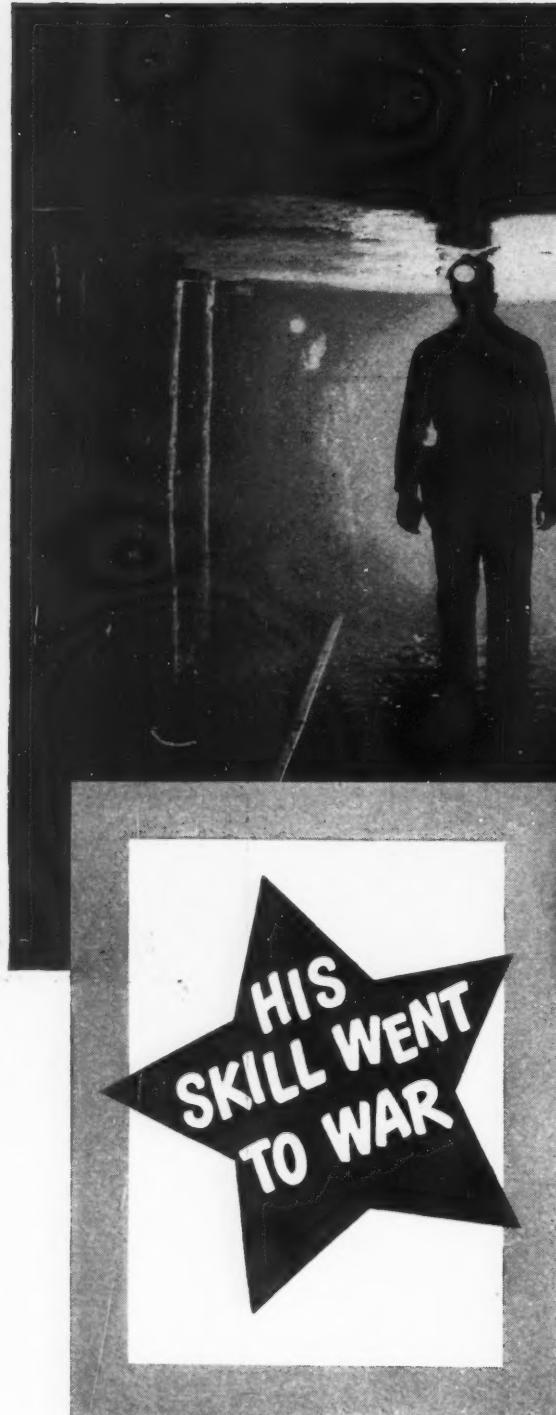
GOODMAN MANUFACTURING COMPANY

N DUCKBILL UNIT
to GOODMAN BELT



 *Duckbill*

HASTED STREET AT 48TH • CHICAGO 9, ILLINOIS



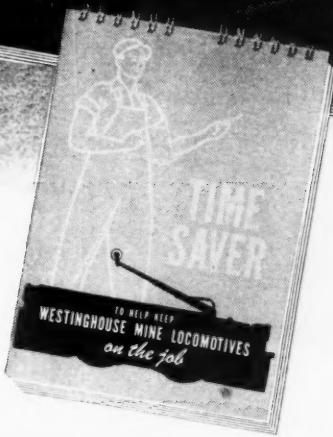
He was a good track man. But the fighting force needed him, and so he went.

In mine track-laying operations, one way to get around the shortage of skilled manpower is to use Bethlehem Steel Ties. They not only last far longer, but, because they are more quickly and easily installed, they save many precious man-hours.

This is proved by time-study figures. It takes 4.5 times as many man-hours to lay 40-lb. straight track on wood mine ties as on steel. And it takes 3.30 times as many man-hours to remove or recover it. In other words, there's a possible man-hour saving of 78% on installing, and 70% on removing, steel ties.

Bethlehem Steel Ties have riveted clips that hold the rails rigidly in place and provide permanent gaging for the track. A hammer blow on the clip does the job of quick installing or dismantling. Write to Bethlehem Steel Company, Bethlehem, Pa., for Booklet which gives complete information about Bethlehem Steel Ties and how they save money in mine operations.

BETHLEHEM PRODUCTS FOR MINES: Rails . . . Steel Ties . . . Frogs, Switches, Switch Stands, Turnouts and Special Trackwork . . . Track Bolts, Nuts and Spikes . . . Mine Cars, Wheel Axles . . . Bars, Plates, Structural Shapes . . . Steel Construction . . . Steel Timbering . . . Pipe, Boiler Tubes . . . Galvanized Roofing, Siding . . . Wire Rope, Strand . . . Drill Steel.



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safety and economy on the job are realized with
ay to go with Westinghouse Explosion-Tested Mine Locomotives . . .
is to use specially equipped for safe operation in gaseous mines.
far longer this modern locomotive design overcomes disintegration
y installed in of insulation and corrosive destruction of internal
parts, thanks to an exclusive Westinghouse development
takes 4.5
ight train
3.30 times
t. In other
of 78%
Other Westinghouse developments are the vertical
brushless gathering reel with easily accessible slip rings
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does the job of overloading of individual sections. These and other
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Booklet B-3232 will give you 24-hour war operation with minimum time
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For complete information, ask for Booklet B-3232.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TO KEEP YOUR LOCOMOTIVES *on the job!*

Send for this pocket-size 40-page "TIME-SAVER".
It is crammed with useful information which will save
you time in inspection, lubrication and maintenance.
Ask for B-3150.

J-90498

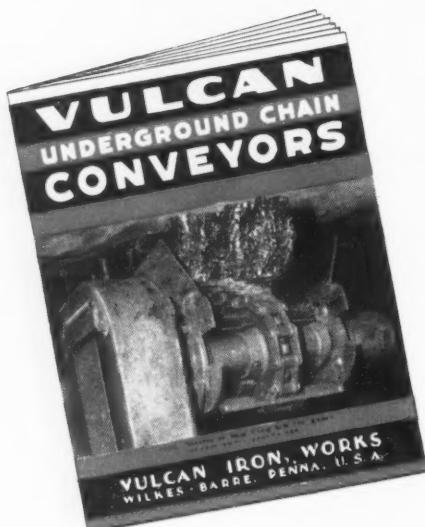
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PLANTS IN 25 CITIES... OFFICES EVERYWHERE

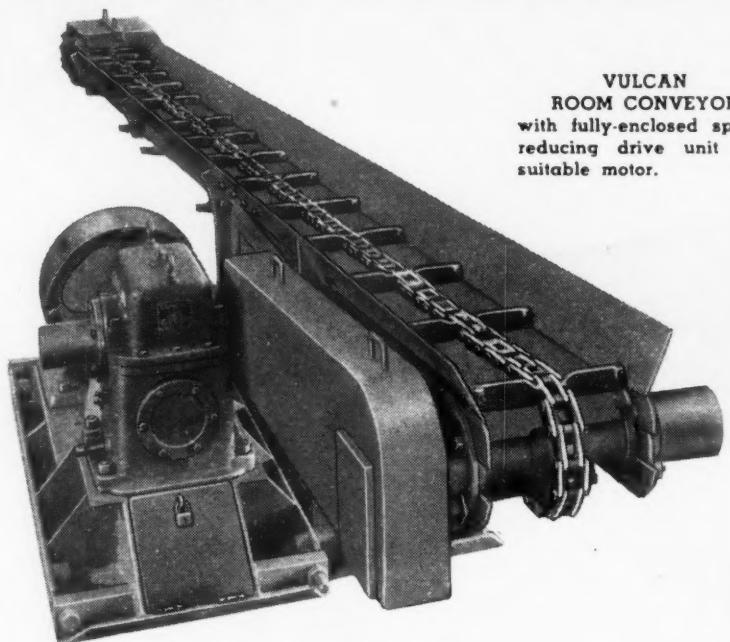


CHAIN CONVEYORS

to meet the
Severest
Requirements
of
Modern
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The Priceless Ingredient of Engineering

★ Perhaps it would be a good idea to spell Engineer with an "I"—for ingenuity is one of the most important characteristics of a good engineer. Couple that intangible faculty with sound education and broad experience and you have the type of engineering skill necessary to carry important projects through to satisfactory completion.

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Maybe your problem—above or below ground—will be our next assignment. You can be certain that A&G service entails undivided responsibility to you. We invite consultation.

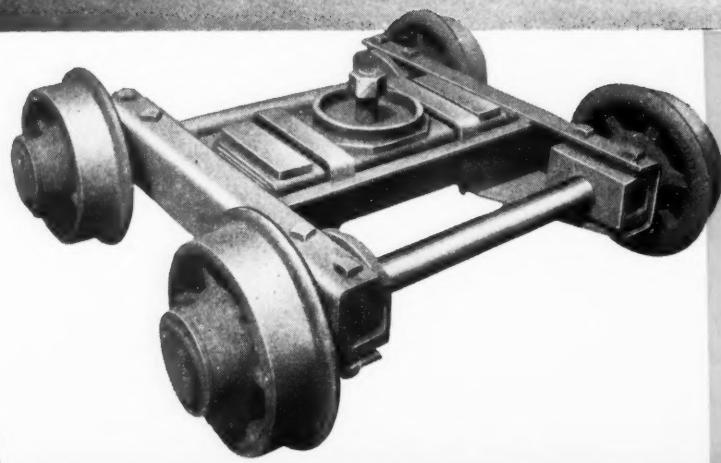
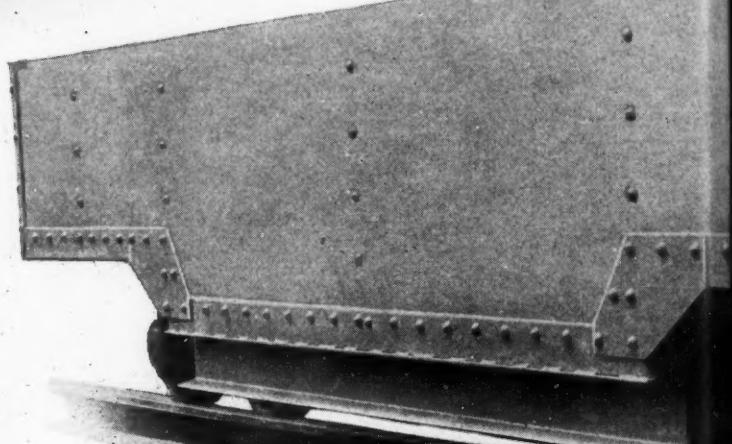
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curves *large capacity mine car*



This ten-ton — or more — car is equipped with through axle trucks, as shown by the photograph. Through axles keep the trucks true to gauge even on the shortest curves. And when we say short curves, we mean curves down below 16-foot radius. These trucks pass around the shortest curves with the least possible friction, because the wheels are Q.C.F. special chilled flange and tread, and each wheel is equipped with the most modern anti-friction bearings. Each wheel rotates independently, so there is no slipping and sliding on the shortest curves.

Center plates and side bearings are ample for the load, and are provided for adequate lubrication. Anti-friction center plates may be arranged for. The Q.C.F. 8-wheel large capacity mine car is designed throughout to carry heavy loads. It has automatic couplers and good brake. Heavy coiled springs, built within the trucks cushion and carry the load. This railroad type car is similar to hundreds of thousands of freight cars we have built that are running on American railroads today, doing a great job. This railroad type mine car will do a great job in your mines.

With Selling Prices at "Ceiling" . . .
Profits Must Come From **SAVINGS!**

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COSTS WITH**

**WALTER
TRACTOR TRUCKS**



THE basic reason why Walter Tractor Trucks reduce hauling costs, is the tremendous increase in tonnage-per-truck. A few Walter Tractor Trucks — each hauling 25-50 tons — haul more tonnage in less time than a fleet of smaller trucks. This drastically cuts expenditures for fuel, manpower and maintenance. In addition, Walter Tractor Trucks put in more work-days the year 'round, because they keep going in conditions that stop anything else on wheels. Specially designed for off-the-road work, Walters haul steadily through snow, soft dirt, rough terrain, slippery surfaces — which makes them unequalled for continuous winter coal hauling.

Behind this performance is a combination of engineering advances found in no other truck. Foremost, is the exclusive Walter 4-Point Positive Drive, which provides rugged power and traction. Three patented Automatic Locking Differentials proportion the torque to the FOUR driving wheels according to the traction of each at any instant, preventing wheel spinning and slippage.

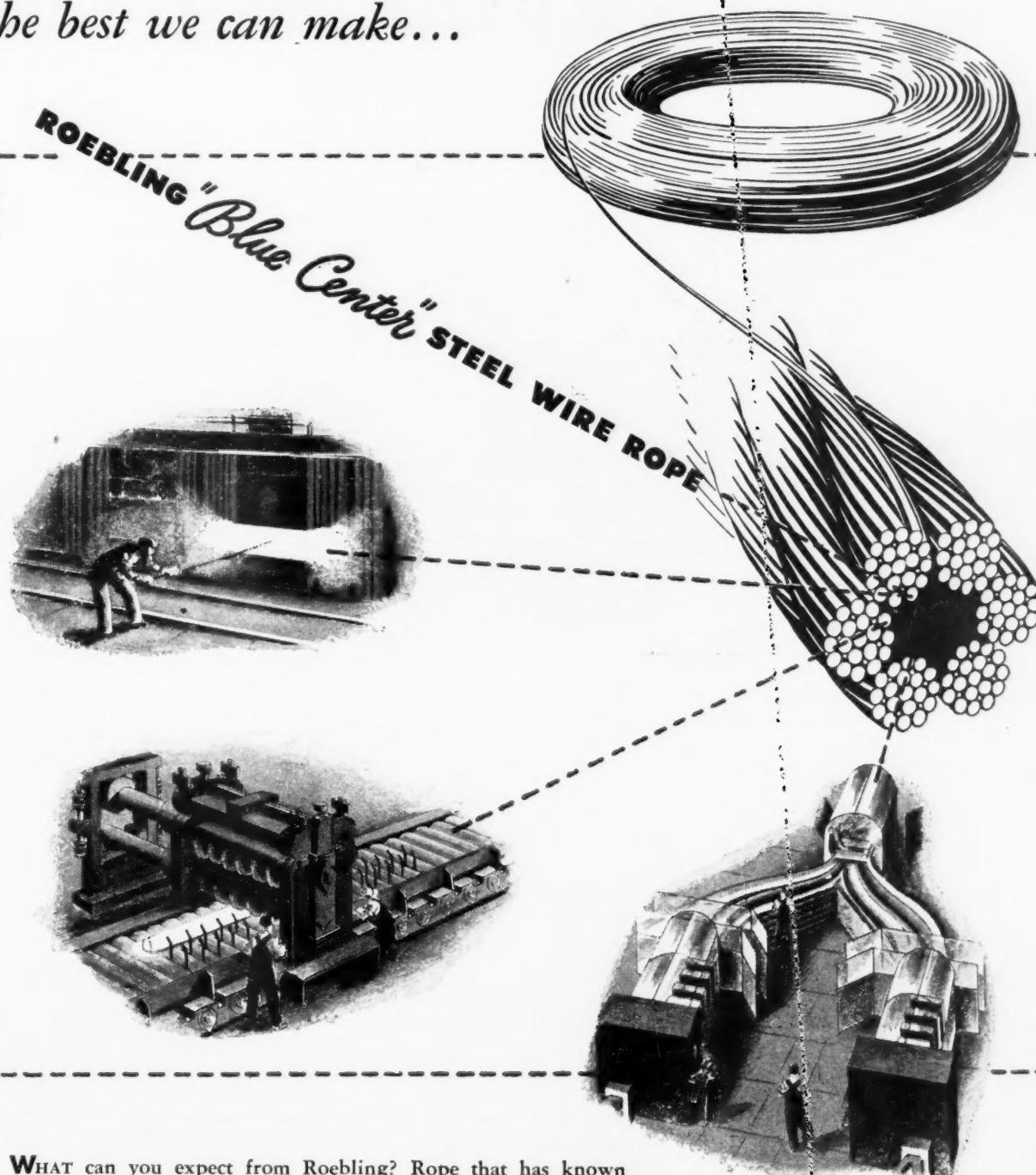
Write today for detailed literature describing these and other features that make Walter Tractor Trucks outstanding for volume, low-cost strip coal hauling.

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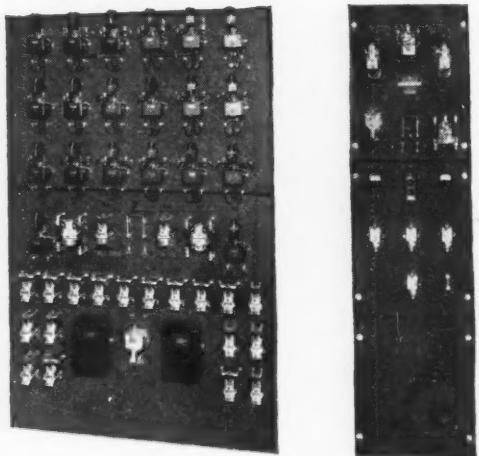
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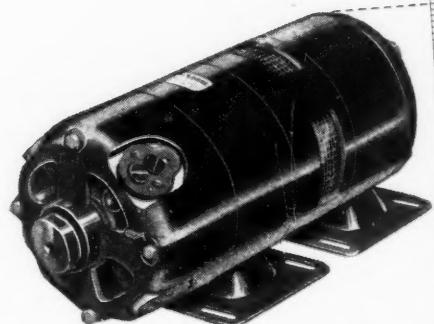
This 20-cu-yd shovel, having exceptionally long reach and high lift, is making a remarkable record for tonnage handled. Amplidyne control permits the operator to make fast getaways, without straining the equipment.



CONTRAST IN CONTROL

(Left) Conventional mine-hoist control panel.
(Right) Control for similar hoist with new amplidyne system. Graphically, this shows how amplidyne assume the duties of field-current contactors, associated relays, and the many current-carrying contacts.

The amplidyne is truly a versatile control tool. Responding instantly to electric signals in the order of 3 watts, it furnishes a controlled flow of large amounts of power, amplifying the signal as much as 10,000 to 1.



EXTRA YARDS per month

G-E amplidyne control helps world's biggest stripping shovels meet today's unprecedented demands for bituminous output

Capable of swinging 60-ton loads at the end of a 60-ft dumper stick, these are the largest-capacity shovels in the world. Yet in spite of their great size, operation is smooth, accurate, and fast.

How do G-E amplidyne controls provide such control? How do they help one of these giants scoop away overburden at better than 35 cubic yards a minute? Amplidyne controls perform a four-fold service:

First, they provide faster acceleration and deceleration for the hoist, swing, and crowd motions.

Second, by their forcing action, amplidyne controls provide higher average cycle speeds.

Third, they assure smooth, uniform application of motor power at all speeds.

Fourth, they act as safety valves, limiting the motor torque to protect electrical and mechanical equipment during stalling or fast reversals.

Shovel control is but one example of where amplidyne controls are speeding "more

coal for Victory." Mine-hoist control is another. Still a third is the quite different application of amplidyne controls to power-factor regulation. Here, amplidyne controls are serving to increase the capacity of long power lines to open-pit operations, by improving voltage conditions.

For experienced engineering assistance on any phase of mine electrification—amplidyne controls, mining locomotives, switchgear, transformers, motors, or controls—get in touch with our local office. *General Electric Company, Schenectady, N. Y.*

FREE thirty-six page book telling and showing how the amplidyne works, and detailing many of its present applications—including electric shovels. Ask for our bulletin, GEA-4053.

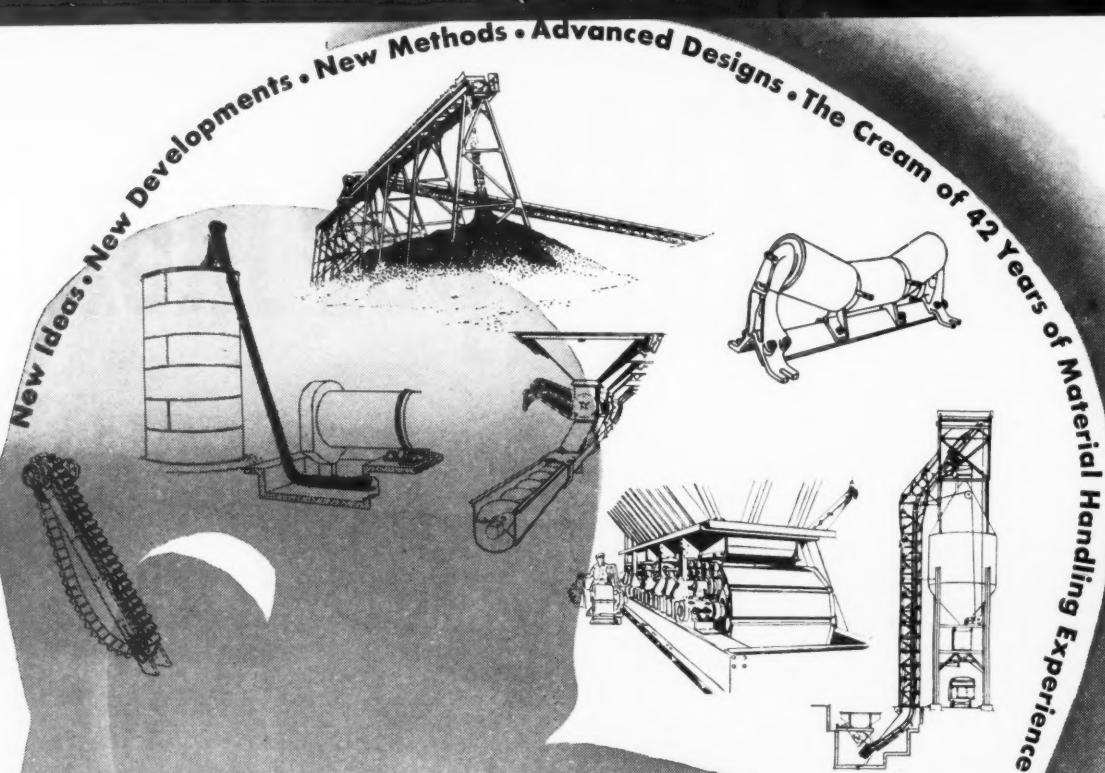


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When an S-A Engineer Tackles

YOUR CONVEYING PROBLEMS

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It is the S-A Engineer's job to study and analyze *your* handling problems... and to prescribe the *proper method and equipment* necessary to do the job efficiently and economically.

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tion which has, for 42 years, devoted its time and energies exclusively to the development and production of better material handling methods and equipment.

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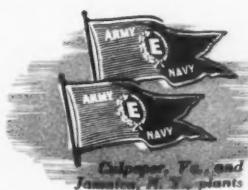
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Ever since Pearl Harbor, and even before, Hazard **LAY-SET** Preformed has been saving time and money for the Government, the Armed Forces, and the taxpayer.

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THE NON-EXPLOSIVE MINING METHOD

THESE 136 OPERATORS

Are Now Using

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Bethlehem Fairmont Coal Company	
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Clear Creek Coal Company	(2)
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Crystal Block Mining Company	
DePue Coal Company	
Detroit Mining Company	
Elk River Coal and Lumber Company	
Gay Mining Company	
Gulf Mining Company	
Hutchinson Coal Company	
Imperial Smokeless Coal Company	(2)
Jacobs Fork Pocahontas Coal Company	(2)
Jamison Coal and Coke Company	(2)
Katherine Coal Mining Company	(2)
Koppers Coal Div., Eastern Gas & Fuel Associates	(2)
Mary Frances Coal Company	
Minds Coal Mining Corporation	
Monongahela Rail and River Coal Corporation	(3)
Pardee and Curtin Lumber Company	
Peabody Coal Company	
Pecks Run Coal Company	
Princess Dorothy Coal Company	
Pursglove Coal Mining Company	(2)
Raine Lumber and Coal Company	
Raleigh-Wyoming Mining Company	(3)
Red Jacket Coal Corporation	
Scotia Coal and Coke Company	
Slab Fork Coal Company	
South Side Company	

VIRGINIA

Standard Fire Creek Coal Company	
Truax-Traer Coal Company	
Turkey Gap Coal and Coke Company	
United Pocahontas Coal Company	
Upland Coal and Coke Company	
West Virginia Coal and Coke Company	(3)
Weyanoke Coal and Coke Company	
Winding Gulf Collieries	(2)
Wood Coal Company	

KENTUCKY

Bell Coal Company	
Bevier-Lamb Mining Co.	
Big Jim Coal Company	
Cinderella Coal Corporation	
Creech Coal Company	
W. G. Duncan Coal Company	
Elkhorn Coal Company	
Hart Coal Company	
Harvey Coal Company	
The Kenmont Coal Corporation	
Knott Coal Corporation	
Morris Brothers Coal Company	
Shearn Coal Company	
Utilities Elkhorn Coal Company	

ARKANSAS

Great Western Coal Company	
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*INDICATES NUMBER OF MINES
USING CARDOX METHOD

CARDOX CORPORATION

ANNUAL Roll Call

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Butler Consolidated Coal Company
 Hillman Coal and Coke Company
 Moffit Coal Company
 Pittsburgh Coal Company (2)
 Edward Tomajko (2)
 Union Collieries (2)
 Westmoreland Coal Company

OHIO

Hanna Coal Company of Ohio (3)
 The Jefferson Coal Co.
 Midvale Coal Company (2)
 Mine No. 6 Inc.
 Warner Collieries Company

ILLINOIS

Bell and Zoller Coal and Mining Co. (2)
 Blue Bird Coal Company
 Consolidated Coal Company
 Franklin County Coal Corporation
 Moore and Sons Coal Company (4)
 Old Ben Coal Corporation (2)
 Peabody Coal Company (2)
 Sahara Coal Company
 Thermal Coal Company

INDIANA

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 Ingle Coal Corp.
 Knox Consolidated Coal Corporation
 Linton-Summit Coal Company
 Pyramid Coal Corporation
 Standard Coal Company

IOWA

Shuler Coal Company

OKLAHOMA

Atlas Coal Corporation
 Premium Smokeless Coal Company

TENNESSEE

Block Coal and Coke Company
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 Black Diamond Fuel Company
 Boulder Valley Coal Company (2)
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 Canon National Coal Company (2)
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 Crested Butte Coal Company
 Crow Bar Coal Company
 Domestic Coal Company
 Double Dick Coal Company
 Giuliano and Sons Coal Company
 Griffith Coal Mining Company
 Imperial Coal Company
 Liley & Merlino
 Louisville Lafayette Coal Co.
 McNeil Coal Corporation (2)
 National Fuel Company (2)
 Nu-Shaft Canon Coal Company (2)
 Oliver Coal Company (2)
 Rocky Mountain Fuel Company (2)
 William E. Russell Coal Company (2)
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EVENTUALLY— *—you'll use this wheel!*



★ The S-D "Floater" Ball Bearing Wheel, unquestionably, is the mining industry's most perfect, simplest, easiest running, and most economical wheel. We sincerely believe that you will use this wheel once you know its advantages. Our past experience has proved the real worth of "Floaters" to you. Proof records of service have made it possible for us to give you a written guarantee against breakage of wheel castings or failure of bearings for five years. And, if you have to grease "Floaters" more than once in five years, we pay the extra costs. Where else can you get such wheel protection?

The illustrations on this page show the simple, demountable feature of "Floaters". In photo No. 1 you see the three nuts which hold wheel in place. Remove these—that's all—and your

wheel slips off, just like an auto wheel. Shown also is the closed front hub and grease connection—no grease leakage here! Photo No. 2 shows the rear hub cap drawn tight with the three bolts and nuts. Photo No. 3 shows how the bearings remain in place on axle in perfect adjustment when wheel is taken off. No further adjustment is required when wheel is replaced.

Tests made by strictly independent engineering firms have proved that the net loads handled by locomotives can be increased tremendously when cars equipped with wheels having any other type of bearings are changed to S-D "Floater" wheels. The power saving is a big item.

Write to us for the complete story on how you can increase production at great savings with "Floaters". Get our Free Trial Offer.

Sanford-Day Iron Works, KNOXVILLE, TENNESSEE

BIG NEWS FOR CONVEYOR BELT USERS!

Here's the finest synthetic rubber belt ever built — comparable to best prewar belts in quality and performance

NOW ready for the toughest materials-handling jobs is the new Goodyear Style SS Conveyor Belt — latest triumph of the great Goodyear Research Laboratory.

"SS" stands for super-synthetic, and this is truly a super belt in every way. It represents years of work by Goodyear chemists and engineers to develop a synthetic rubber construction suitable for heavy-duty conveyors. Hence, with the mandatory conversion to synthetics, Goodyear was ready.

In a class by itself

In this new Goodyear SS construction you get the first synthetic rubber belt with the high resistance to abrasion and cutting and long flex-life essential in heavy-duty conveyor service.

It has high heat resistance,

too, making it suitable for handling hot materials. It also retains its flexibility at extremely low temperatures, an important feature in year-round outdoor operations.

In performance and long life,

you will find it superior to any synthetic rubber belt made today, and comparable in many ways to the best prewar belts. Yes, it costs a little more, but if you buy on a cost-per-tons-handled basis, you will find it costs far less in the long run.

Consult the G.T.M. — Goodyear Technical Man — for full particulars, or phone your nearest Goodyear Industrial Rubber Goods Distributor.

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are tested and proved in the
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THE GREATEST NAME IN RUBBER

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— says *Romey

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We're looking forward to the time when we will again be free to supply you.



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ROME CABLE
CORPORATION
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Get a Coal's Eye-View of the BUSINESS END of the Whaley "AUTOMAT"



★ How many tons a minute will it load isn't all you want to know about a mechanical loader. Knowing its capacity, of course, is of first importance, but equally vital is—how does it do the job?

If you are interested in a mechanical loader, by all means watch them load coal before you buy. Take a coal's eye-view of the business end of a Whaley "Automat" . . . watch its big capacity, natural vertical shovel action loading head—4 feet wide—working at approximately 47 strokes per minute. Watch the "Automat's" wide, large capacity, smooth running conveyors function. See how easy the

"Automat" is operated and maneuvered. Then, and only then, will you realize why only one 25 H.P. motor is necessary to operate the "Automat". Furthermore you will learn why the exclusive vertical shovel action of the "Automat" makes it the safest loader known. Let us tell you where you may see them in operation. Write Myers-Whaley Co., Knoxville 6, Tennessee.

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Mechanical Loaders Exclusively—
For Over 35 Years



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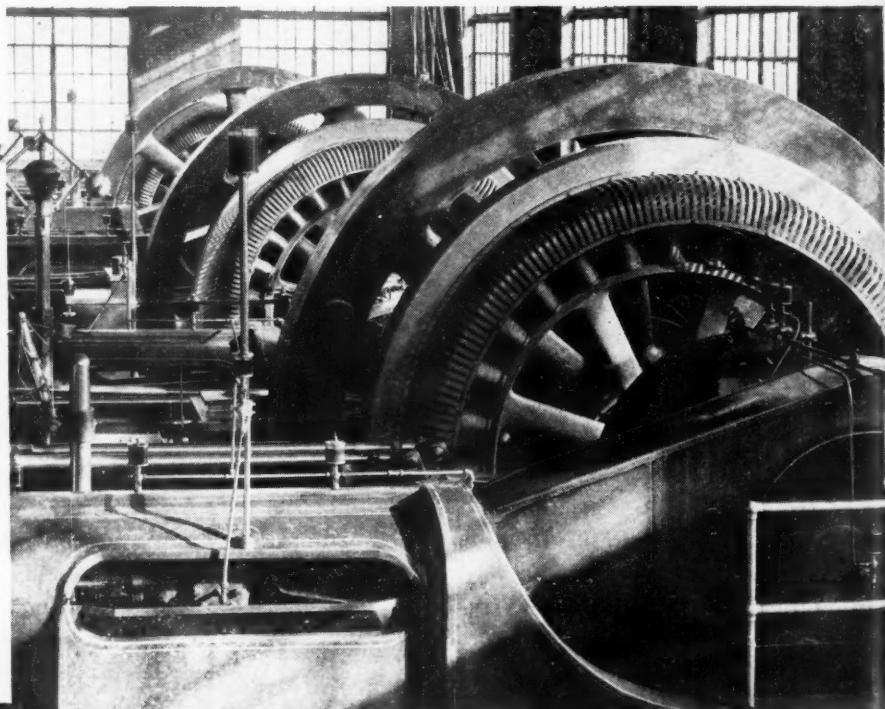
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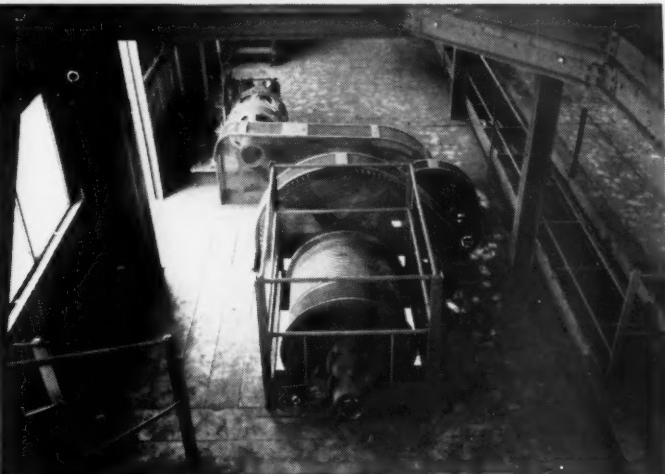


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COAL HANDLING AND PREPARATION EQUIPMENT



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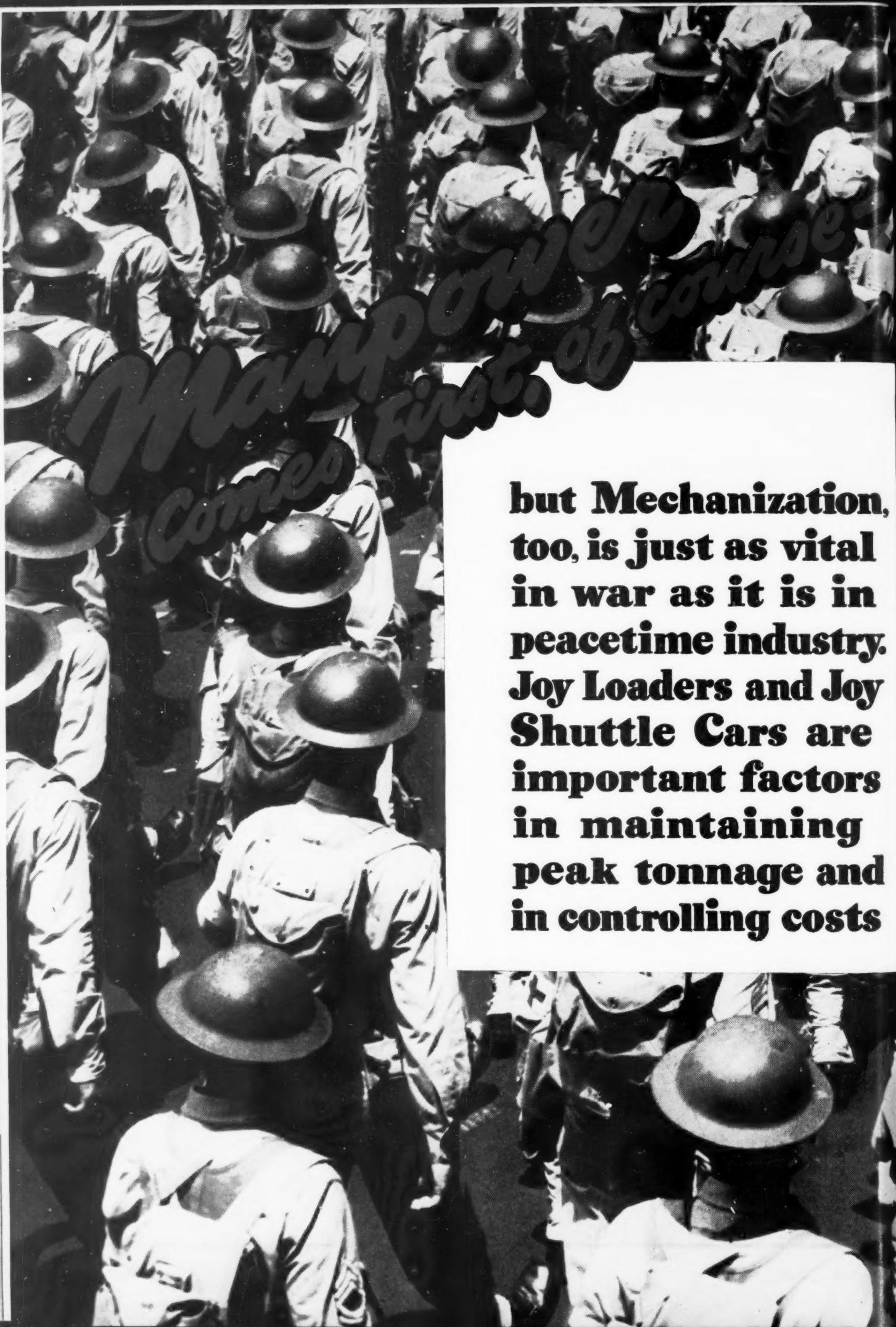
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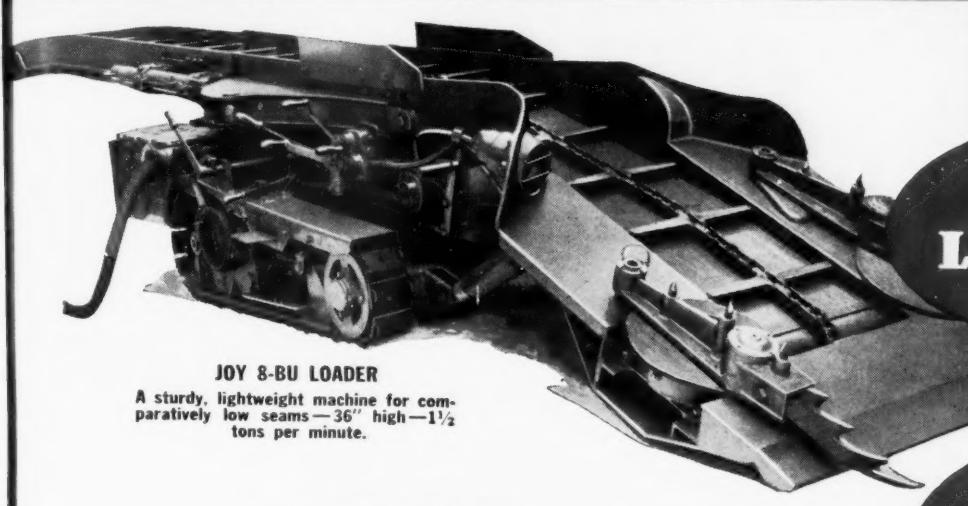
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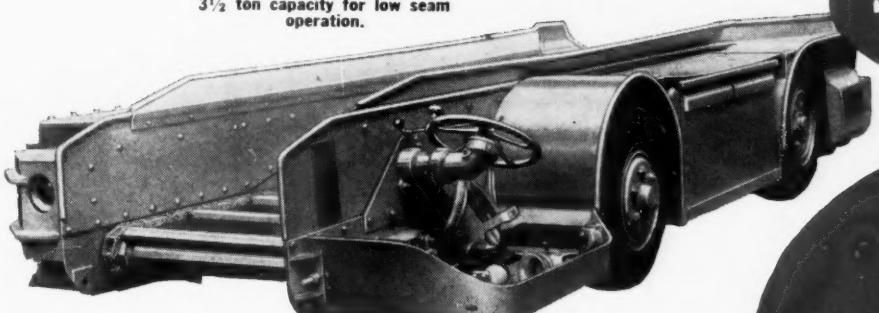
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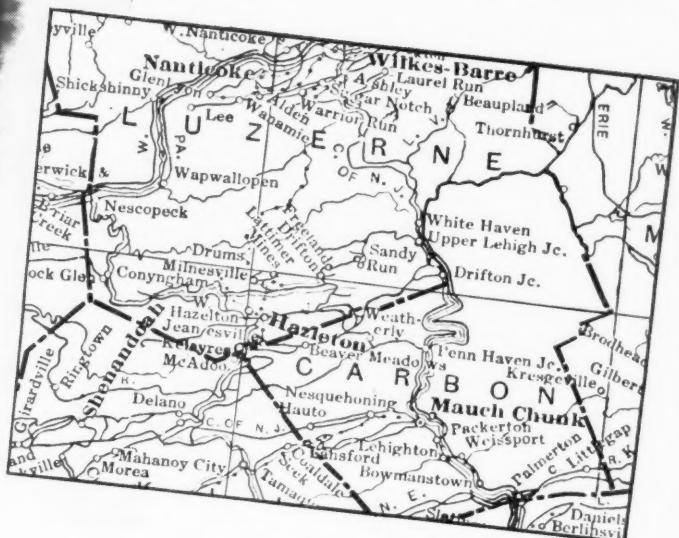
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FRANKLIN, PA.



They gave me a miner's hat and down I went

I put in a call for 5 o'clock, not because I wanted to get up that early, but because Mac suggested it. He had a mind like a timetable: breakfast at 5:30, trolley at 6, ride ten miles to the mine, and go down with the 7 o'clock gang. "You'll need time to change your clothes," he said.

But I'm ahead of my story. It was the winter of 1916. I was busy introducing Cordaeu, the detonating fuse new at that time; but occasionally we'd get a call from some user of Safety Fuse who was having trouble. Mac was selling powder in those days, and we worked together. This hurry-up call was from one of his coal mines using Safety Fuse.



"This may be your trouble," I said.

When I got up at five o'clock it looked like the middle of the night; and it still looked like the middle of the night two hours later when we reached the tipple; a cold, dreary morning, with nothing good about it. In the office I met Judson, the boss of Section 3, who was to take us in tow. We changed our clothes and they gave me a miner's hat and down I went. I'd been underground before, of course, and plenty of times since, but I don't think I'll ever get my insides trained to going fast straight down. I always sort of

wonder if the fellow at the hoist is absent-minded! He never is.

The company was working a new section at the 600-foot level and had run into quite a lot of water. Up at the face they'd had trouble with missed shots; sometimes two or three in a round would fail to shoot.

When we got to the face we found the gang just about ready to load the round. I watched the miner make his first primer cartridge; he *laced* the fuse through the stick instead of tying the two together with twine. I asked Judson to hold up the work while we examined the primer together.

"Looks like this may be your trouble," I said. "You're using Charter Oak, which is O K in Sections 1 and 2, but you've got a very wet condition here. Charter Oak-Gray would be better, or Clover."

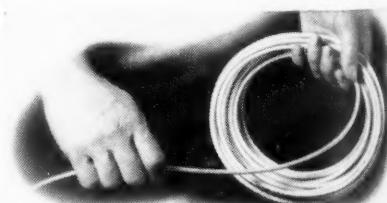
"And another thing: lacing a fuse through the cartridge puts in two *sharp-angle bends*. Fuse is flexible, and a sharp bend might not do any damage; but here you've got a deep hole full of water. This fuse was probably cold when brought down. Taking a cold fuse intended for ordinary work, bending it almost double, and leaving it soaking in water, is

taking chances. The trouble here is that they *haven't kept their powder dry!*"

Well, sir, I loaded that round myself. Used some of our Clover Brand and tied up the primers with good tarred twine. I trimmed the round and lighted it, and then we all got into the clear and counted. *Every hole fired.* . . . After that they switched to Clover and had no more trouble.

Most blasting trouble can be traced to little things — in combination. A cold fuse, a sharp bend, a wet hole, a long wait — each in itself might not cause fuse failure, but take them all together and you're taking chances! We never take chances in the manufacture of Safety Fuse.

THE ENSIGN-BICKFORD COMPANY
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ENSIGN-BICKFORD
Safety Fuse
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Also Makers of Primacord-Bickford Detonating Fuse

Coal Age

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

January, 1944

No Substitute

WITH an improved production picture, provided it continues, coal mining faces 1944 with some problems at least alleviated. But it also faces major new ones growing out of new contractual relationships and loss of control—at least temporarily—over many of the elements entering into cost of product. This loss of control to federal agencies for the duration might be more palatable had many of them shown more ability in exercising it.

But production is up. Even this, however, cannot be credited entirely to governmental action. If to any one, credit should go to the Illinois operators who showed the way. Government could have lengthened working time in Seizure No. 2 but did not, on "technical" grounds. Then it forced the Illinois agreement on the remainder of the industry without a chance to express an opinion on the grave problems presented. Thus, the 45-minute "travel time" and other disruptions of established conditions. The southerners' stand that lengthening working time should be done by specifying definitely hours at the face possessed at least the merit of logic.

Coal can surmount these difficulties, as it must. And it will have new incentive in the record of government control so far in World War II, which certainly is no advertisement for the continuation of these or similar controls in peacetime. Free enterprise has far and away the better of the argument and coal, along with its wartime job of production, should bend all its efforts toward a return to that basis for the benefit of its employees, its stockholders and—above all—its customers.

Still Vital

THE FACT that a number of oil distributors fully expect fuel oil to regain its losses and extend its markets in the future should be food for thought in the coal-mining industry. Perhaps these optimists are just whistling past the graveyard, but again they might be right in professing to see an ample supply of petroleum in the future, despite considerable evidence to the contrary at the moment. In any event, coal should be ready to battle for its prize market or, as a perhaps even more attractive alternative, to supply part or all of the liquid fuel now derived from petroleum.

It comes down once more to research—research to

improve product, research to develop more efficient methods and equipment to burn coal with greater economy and convenience, and research to convert coal into liquid or gaseous forms. While coal has had other problems to cope with recently it should not forget that the future holds plenty of competition. More money spent in research—now—will mean more returns in coal sales in the future.

Air No Mystery

SAFETY and productivity both are involved in mine ventilation. Good ventilation dilutes, renders harmless and carries away noxious or explosive gases or dust. At the same time, it insures conditions in the working place most conducive to the production of coal.

What is ventilation? Boiled down, and stripped of mathematics and formulas, it is supplying a means of setting up an air current and then directing that current to the face or other point of use with the least loss and expenditure of power. For these purposes, the operator has available fans and blowers, stoppings, overcasts, doors, curtains, regulators, tubing and brattice materials. In effect, a ventilating system is much like a water system with its pump, pipe and valves and much the same principles of regulation and operation apply. Ventilation is, in reality, rather simple. A session with a mine map and the application of a little horse sense will go far toward evolving an efficient system. Then the mathematics and formulas may be called upon in working out the details and sizing up the results.

The fan should be suited to the job. Air travel should be kept as short as possible. Splitting helps in this and provides other advantages. If possible, the main return should go outside at the first possible opportunity and not be brought clear back to the fan—in other words, one-way air travel. Every possible effort should be made to prevent loss of air before it reaches the working face. And to make sure it reaches the face, brattice lines or tubing may be employed. Airways should be large in size and free of obstructions. Keeping them clean is essential, although there are exceptions. Cleaning up a regulated split, for example, may be a waste of money. In revising a ventilation set-up, a good rule of thumb is to tackle the high-velocity sections first. By observance of these and other fundamentals, good air at the lowest possible cost is assured.

How To Reduce

Absenteeism has been termed the "worst affliction" of considerable extent. In these pages, Coal Age ex-

By JAMES R. SUTPHEN, Assistant Editor, Coal Age

THE SECOND FRONT has attracted scarcely less attention in the past two years than absenteeism. Some of the study devoted to absenteeism has been solemn scholarship and some has been flippant quackery, but none has been conclusive. Every war industry has been affected in varying degrees by absenteeism, yet none has found a cure. Remedies, of course, have been discovered, reductions have been effected, but no cures. And of all the war industries, bituminous coal, according to the Bureau of Labor Statistics, is in the worst position.

The Labor Department reported that for August bituminous coal had an absentee rate of 9.4, highest of any recorded industry. Anthracite's record was far better, its 5.6 being about in the middle of the list. On that basis, bituminous coal has lost through absenteeism the opportunity to get out during the course of one year about 40,000,000 tons. It may or may not be coincidence, but 40,000,000 tons is the figure which Secretary Ickes has offered as the anticipated production increase as a result of the wage contract he signed with John L. Lewis.

In all that has been said and written about absenteeism, no one has even claimed to have found a universal cure. COAL AGE sets itself up as no exception. Yet its editors have spent weeks, travelled thousands of miles and talked to dozens of persons on absenteeism. On the basis of that experience, they can present the main causes and the obvious results, and suggest cures that others, at least, have found helpful. There is as yet no magic elixir. The best any industry can do is wrack its own brains and copy the best parts of what the other fellow has done.

To start with, absenteeism in coal is a problem that affects every branch of management, from section boss to president. The section boss cannot

work without an adequate crew. Unless he has an adequate crew, coal will not be mined. And unless coal is mined, production declines, and not only the industry but the war machines which it feeds will be slowed, perhaps halted. Any miner avoidably away from his job is a stick in the spokes of the war effort's churning wheels.



LIGHT ON THE PROBLEM

What others have done and how it has worked.....p. 49

The employee's slant on absenteeism as seen by Whiting Williams p. 50

Handling the question of More money to spend.....p. 52



Executive management may be able to impose disciplinary measures to halt absenteeism and to promote educational efforts to discourage it. But the face boss will be the one who knows whether those efforts work, who knows more of the causes and the effects of the cures than anyone in the industry. Likewise, the supervisory force is probably the industry's strongest weapon in fighting absenteeism.

The problem varies with the mine field, but only in degree of severity, for it is a problem everywhere. The 9.4 figure of the Bureau of Labor Statistics probably is not a true reflection of the real picture. It is based on loss of one entire regularly scheduled shift and does not differentiate between excused and unexcused absenteeism. Some mines follow that procedure, others have a different for-

mula. Some include tardiness, some include regularly scheduled days off. One of the major difficulties in discussing absenteeism is that almost everyone has a different definition for it and thus arrives at a different conclusion.

But all agree it is a serious matter. Estimates run all the way from one mine's less than 5 percent to another district's 46 percent over a holiday weekend pay period. R. E. Salvati, general manager, Island Creek Coal Co., Huntington, W. Va., told the American Mining Congress that absenteeism was the worst affliction of the coal fields. Charles C. Dickinson, president, Dickinson Fuel Co., Charleston, W. Va., at the National Coal Association meeting, said it meant the difference between just meeting production goals and having production beyond the nation's greatest needs. It will seriously effect the war effort unless perceptibly reduced contends another operator, Eugene McAuliffe, president, Union Pacific Coal Co., Omaha, Neb.

The Bureau of Labor Statistics gives these figures for reporting bituminous and anthracite companies from March, 1943, when the records were started, to August:

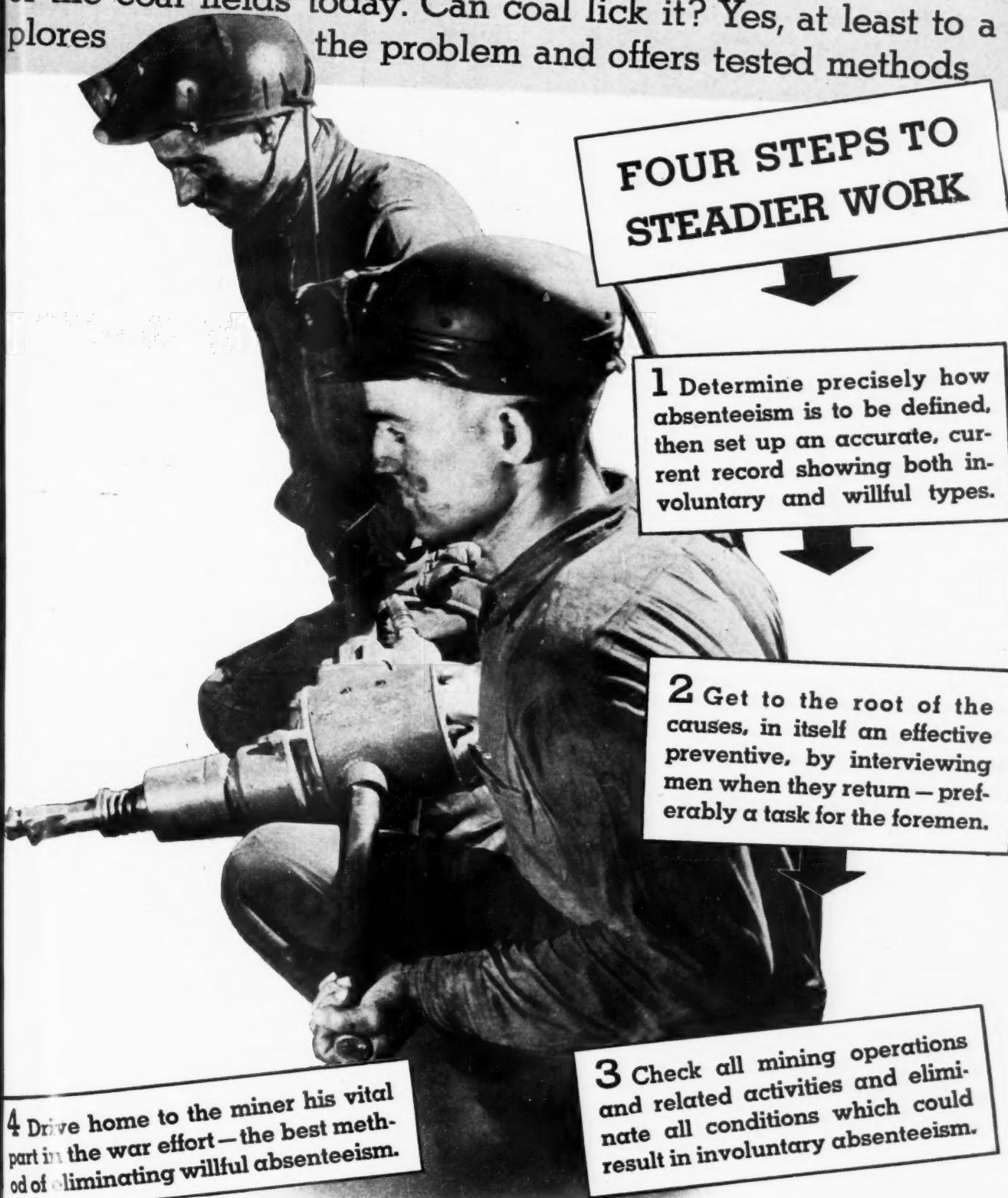
	Bituminous	Anthracite
March	8.0	5.4
April	9.7	8.8
May	8.4	5.3
June	8.1	4.9
July	8.9	5.1
August	9.4	5.6

In every month except March bituminous coal led all the rest. In that month, shipbuilding exceeded it by 0.2 of a point and in June they were tied for the doubtful honor of first place. Anthracite on the other hand, clung persistently, except during April, to the middle of the list, and in each month was better than metal mining.

Individual companies, however, had

Absenteeism

of the coal fields today. Can coal lick it? Yes, at least to a
plores the problem and offers tested methods



4 Drive home to the miner his vital part in the war effort — the best method of eliminating willful absenteeism.

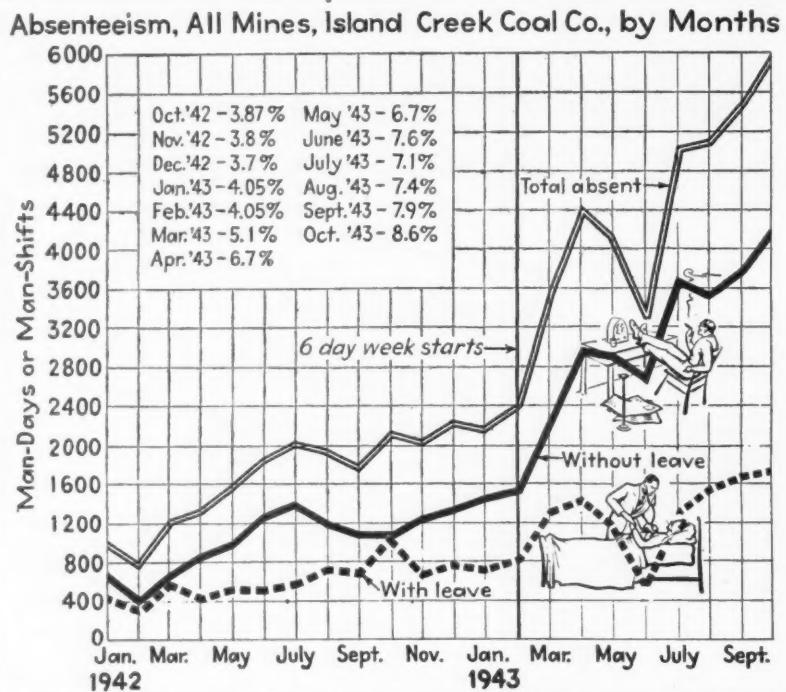
FOUR STEPS TO STEADIER WORK

1 Determine precisely how absenteeism is to be defined, then set up an accurate, current record showing both involuntary and willful types.

2 Get to the root of the causes, in itself an effective preventive, by interviewing men when they return — preferably a task for the foremen.

3 Check all mining operations and related activities and eliminate all conditions which could result in involuntary absenteeism.

LONGER WORK WEEK AGGRAVATES ABSENTEEISM



Typical of many companies, perhaps, is this record for all mines of the Island Creek Coal Co. A major increase followed institution of the six-day week in February, 1943. Constant pressure and change of appeal has been found the best method of preventing the situation from getting out of hand. A daily record is kept of absenteeism, with a weekly report to the production management showing causes: sickness and accident, illness in family, death in family and other causes with and without leave.

Steps taken to deal with the problem include fostering competition between mines, equipping foremen to appreciate and handle the problem, better food supplies, improved safety and health conditions, prizes for essays by school children, radio and newspaper ads, assistance in transportation and personal problems, Navy incentive program speakers, rallies and morale building through religious, welfare and recreational programs. "Service awards" are planned for steady workers.

a much worse picture to paint than did the Labor Department. Union Pacific reported its absenteeism had risen from 5.2 in September, 1942, to 12.4 in July, 1943, and was still climbing. Peerless Coal & Coke Co., Vivian, W. Va., reported a low for underground workers of 11.2 in June and a high of 14.9 in October. In the Pittsburgh area, operators report percentages ranging all the way from 5 to 15.

"Why do men stay away from work?" That is a proper question in any discussion of absenteeism, but perhaps a better one would be: "What kind of thinking impels a man to stay away from work?" But to get at the first question first, the causes must be broken down into excused and unexcused, voluntary and involuntary absenteeism. Under excused absenteeism are illness and injury, transportation and housing difficulties and personal reasons, such as family difficulties, home responsibilities, shopping, personal needs, rationing, selective service, legal matters and others. Obviously some of the absenteeism listed as personal can be classed either as excused or unexcused, depending on the person doing the excusing and the validity of the excuse.

Granted that coal has more absenteeism from illness and injury than certain other industries because of occupational hazards, it nevertheless

should find that margin offset by lack of any substantial transportation and housing difficulties. Many coal communities are not industrial boom towns. They are permanent institutions, and have lost rather than increased in manpower during the war.

Coal companies are doing as much as other industries to protect the health and safety of their employees, probably more. It is not with this type of absenteeism we have to deal. It is avoidable absenteeism that is the trouble and while there is no breakdown in existence for coal other industries find it accounts for about 47 percent of all absenteeism.

Valid or Not?

The line of demarcation between avoidable and unavoidable absenteeism is hard to draw. Is a hangover legitimate illness? A man may feel lazy with a light cold and not show up for work. Is he excusably ill? Or he may want money that week and show up when he should be in bed. Should he be sent home? Is a fight with his wife avoidable family trouble? Can a man be blamed who takes a day off when his son is home on furlough? Yet he is avoidably absent.

Perhaps the best classification of avoidable absenteeism is absence from work deliberately and willfully or as

the result of a cause deliberately or willfully created. Thus, a Monday-morning hangover may be illness and absence from work may not be deliberate at the moment but the cause that brought the hangover about was willful and deliberate.

The problem, then, becomes not so much one of remedying physical conditions as of eliminating mental conditions. It is to be assumed that any coal company, for its own protection, if for no better reason, is doing and has done its best to eliminate the causes of unavoidable absenteeism by promoting safety and health, by improving transportation and housing facilities and by helping with personal and family problems. There is an irreducible minimum beyond which those causes cannot be eliminated. Most authorities put it at 2.5 percent. If that is so, then bituminous coal has a bulge of about 6.9 percent and anthracite of 3.1 on which to work.

If every company is satisfied it is doing its best to prevent accidents on and off the job, to promote occupational and private health, to persuade ration boards to meet at night, to persuade shops to stay open after hours, to get employees to arrange for days off in advance where possible to attend to necessary family and personal matters, then they still have left the problem of the man who stays home be-

TESTED METHODS FOR DEALING WITH ABSENTEEISM

* Indicates actually tried in coal mining

METHOD	APPEAL	EMPLOYEE REACTION
★ Posting names of absentees alongside company armed service honor-roll	Patriotic, shame	Company reports employees laughed at idea
★ Lottery for war bonds with only perfect attendants eligible for drawing	Reward	Too new to estimate, but reception to announcement good.
★ Outright awarding of war bonds to perfect attendants	Reward	Company reported employees uninterested; failed to halt absences
★ Use of posters decrying absenteeism and urging greater war production	Patriotic	Companies report good effect immediately after posting, say it wears off quickly; posters must be changed often
★ Charts showing names of absentees and whether they were excused or unexcused, posted in prominent place	Scare	Has advantage of getting at cause quickly, as man posted as unexcused will seek to have listing changed
★ Displays showing how absenteeism affects war production	Patriotic	Approximately same reaction as posters
★ Individual talks to absentees by labor-management committees, union committees and/or company officials	Reasoning	Reports seem to indicate universal satisfaction with this method, which also quickly reveals cause
★ Propaganda and appeals in house organs	Patriotic and reasoning	Hard to gage, but probably has some cumulative effect
★ Use of German money or notes from Hitler in pay envelopes of absentees	Shame, scare	Works in some cases, but is likely to stir resentment
★ Talks to employees by war heroes or government and armed service officials	Patriotic	Good at moment but effect fails to last.
Use of visible display, such as swastika or yellow paint on time-clock slip of absentee	Shame	Most reports indicate punishment visible to other employees causes resentment
Talks to absentees by fellow-employees with relatives in service	Patriotic, reasoning	Good. One company cut rate 25 percent this way
Signing of pledge to report every day, health permitting, to stay healthy and to report anticipated absences in advance	Patriotic, sense of responsibility	Good at first, but effect does not last
★ Production charts showing quotas, output and tonnage lost by absenteeism	Patriotic, pride in work	Good cumulative effect
Interdepartmental competition with visible award to winning group	Competitive	Hard to adapt to coal mining in many cases but where tried elsewhere effect was good
Telegrams from company to absentee, followed by visit of official or union committeeman to home	Reasoning	Workers sometimes resent "snooping," must be handled diplomatically, but reveals cause quickly.
★ Suspension or layoff for chronic absentee	Fear	Manpower makes it hard to use in coal. Employee in little fear of being fired at present

cause he does not feel like working. Coal is not subject to one problem, at least, that plagues other industries: women workers. There is no need for the mine operator to arrange for beauty shops at the plant or, for that matter, to be unduly concerned about shopping hours. In fact, the circumstance that the woman of the house in the average coal community is still a housewife and not a welder eliminates, or should, many of the causes of absenteeism in war plant centers.

As a result, it might be fair to assume, in view of the lack of positive figures on the subject, that avoidable absenteeism in the coal fields runs at a higher rate than it does through other industry. That is an unfortunate conclusion for the coal operator and the section boss, because it means that both of them must tackle the problem from the psychological angle more determinedly than other industries are compelled to do.

Many coal companies have already recognized this condition and while they might not call it by the same name they have endeavored to apply psychological cures: to change, in other words, by one method or another, the thinking of a man who deliberately stays away from work. Under this classification come the two extremes, punishment and reward. But there, once more, the treatment is directed at the symptom rather than at the cause and unfortunately, as in some skin allergies, it sometimes aggravates the symptom instead of curing it.

Both Must Help

The cooperation of two agencies is needed to change the attitude of the chronic willful absentee—management and labor. Management can plant the seed and till the soil but it takes labor to make the plant flourish. Has John L. Lewis ever made an exhortation against willful absenteeism? It might not be too much to say that Lewis's attitude toward the war, quickly and sensitively absorbed by district leaders and miners, is the greatest single cause of absenteeism in the coal fields. When labor leadership takes no hand in halting absenteeism, when on the contrary it is openly unsympathetic toward patriotic appeal, it is difficult to convince the miner that he has a war job to do.

But in this instance, at least, a job half done is better than one not done at all and if management discharges its responsibility toward correcting an absentee miner's attitude who knows but perhaps some of the philosophy may permeate deep enough to have effect.

Methods thus far adopted for check-

ing absenteeism, generally speaking, fall roughly into two classes—reward and punishment, or scare psychology and merit psychology. Both must be approached gingerly. Punishment often stirs resentment that augments the problem it seeks to reduce. Akin to punishment, and almost as dangerous in operation, is the "shame-them-out-of-it" method, such as the addition of German marks to an absentee's pay envelope or a "Thank you" note from Hitler. Too often, industry has found, such a plan, especially when it is visible to other employees, makes the absentee mad but doesn't change his attitude.

In an adjoining column is a summation of some of these methods, more properly classified as "stunts" for they are not truly methods. Some have worked, some have not, but what is more important is the psychology which prompted them and the atti-

tude which greeted them. Broadly speaking, it is a dual psychology, composed of an idea that man can be bullied into staying on the job and a despair idea of "Oh, they won't work no matter what you do." **COAL AGE** does not believe either is true. Experience at most plants has shown, as the table reveals, that "scare" tactics work only temporarily or not at all. And certainly the situation is not so bad that coal must admit defeat before it has fairly started to fight the battle.

Too Much Money

But there is one psychology that holds sway in almost every coal field in the country and because it is so universal it is worth more than passing mention. Paradoxical though it is, it can be summed up in one sentence:

"THEY HAVE TOO MUCH MONEY."

"The incentive wage," Mr. Salvati

SHALL I WORK TODAY?

The miner's slant as seen by Whiting Williams



After talking recently with wage earners, union leaders, managers and others in various mine and factory towns, I'd say that many coal diggers figure it out like this:

Too much taxes—Inasmuch as all deductions are subtracted from the lower brackets of the week's earnings, the larger figures shown for any long week make it look as though too much of a man's overtime pay goes into the pockets, not of himself, but of Uncle Sam.

There's always tomorrow—For perhaps the first time in his life, a miner today can roll under his tongue the pure satisfaction of his present "dream world"—a world free from the old threat of "no work tomorrow." And with store shelves bare of all attractive things, what can money bring half so alluring as leisure—fear-free leisure?

Draftitis—Facing all the dread risks of war service scheduled to begin 30, 60 or 90 days hence, many a young miner and his wife figure that a few grand splurges will furnish life-long memories worth more than any imaginable amount of money.

Contractitis—"They tell us victory depends on coal. But if that's true, why hasn't government helped us get a contract long ago?"

Ration blues—"If our sweat is so important, why do they make us eat 'dog food,' refuse to give us any bigger meat rations than the people who loaf all day in their fine offices?"

For all this, the best antidote I know is: closer contact and more explanation. "Explain, explain, explain. If you can't explain, explain why you can't explain!"



Putting the message over—Peerless Coal & Coke Co. uses its bulletin board to drive home to employees that coal is a war material and its production directly benefits the men on the front line.

said in discussing absenteeism, "means almost nothing in the coal fields with earnings so high that it is impossible to spend them because of the shortage and absence of all durable and certainly all luxury goods. Why earn more than can be used? Money is not an incentive compared with the automobile, the radio, electric appliances and all luxuries."

That is certainly a fair and accurate statement of the problem and COAL AGE thought one of the best sources to ask about it was a company which had adopted a war bond bonus plan to encourage perfect attendance, since the company had deliberately invited the miners to try for more money. Here is what this company said:

"The theory is that workmen are no longer able to purchase new or used cars or gasoline or tires for the cars they still own and are also unable to purchase radios, refrigerators, washing machines, electric or other stoves, household gadgets and the like and therefore lack the incentive to earn to pay for these things."

"In this connection we are inaugurating an illustrated campaign designed to include savings through the purchase of war bonds and placing emphasis on the fact that when such

merchandise is available; three \$25 bonds will buy a radio, four a washing machine and so on. We are sticking our neck out to the extent of suggesting that many of these types of consumer goods will, to some extent at least, be available before peace comes. Our men seem to crave these items now that they are unobtainable and we hope that this campaign will induce them to work and save so that they can be among the first to buy when the time comes."

"Another project has been the improvement of the exterior of company homes as fast as materials for this purpose can be obtained in the hope that the occupants will be inspired to refurnish the interiors, and we are trying to make it easy for them to purchase new household furnishings which would create an incentive to work steadily in order to pay for them."

Pay Day Prosperity

The problem of siphoning off the excess cash is one which is worrying the entire country but it concerns the coal fields particularly because almost every operator agrees it is a prime cause of absenteeism. This country has had enough experience to know it cannot

legislate its citizens' morals, so closing the local bistros on Saturday night will not prevent a hangover Monday morning. The man who is after a hangover will get it, no matter where, as the lamented period from 1920 to 1933 revealed. But there are ways in which what might be called the absentee bulge in money can be used to the good advantage of its recipient, to coal production and to the war effort.

Encouragement of war-bond purchases is a prime way of absorbing the extra cash that tends to promote absenteeism. A sales tax is another, but if the same result can be achieved by encouraging the worker to make an investment—bonds—which supports the war program and leaves him a nest egg for the future, possible charges of discrimination and unfairness can be avoided. In addition to bonds, there are other uses for surplus money which benefit everybody concerned and especially the worker. Examples are liquidation of debt, insurance, stocks, bonds and tangibles, such as household equipment and conveniences.

Such a program is double-barreled. Not only will it provide an opportunity for spending and thus encourage steady work but it will give the miner

THE ANSWER TO SURPLUS CASH

Coal-mine absenteeism and extra cash are directly related. The cure lies in outlets for the surplus that will benefit both the worker and the war effort. Some things industry can do to achieve the goal are:

1. Encourage investment in war bonds to support the war effort.
2. Encourage investment in war bonds as a means of making possible future buying when goods are again available.
3. Appeal to the saving instinct of women. Even if miners are not constitutionally constructed for saving, there never was a housewife who did not want a little nest-egg laid away for emergencies.
4. Provide opportunities for saving in the

form of banking facilities and other places for putting away surplus money.

5. Encourage what household improvements that can be made now under rationing regulations. They are numerous if ingenuity is employed.

6. Encourage debt liquidation.

7. Encourage, in addition to war bonds, the purchase of intangibles — stocks, bonds, insurance, even stock in the miner's own company — which will not only give him a place for excess income but a renewed interest in the progress of private enterprise.

8. Encourage the purchase of such luxuries as are available. A diamond ring is better than a series of three-day binges.

a stake in the community and thus make him more ready and willing to listen to arguments against inflation.

These suggestions, however, are all academic unless the root of the problem is attacked. What must be eliminated is not accidents, inadequate housing, inconvenient ration-board hours or too much money. What must be eliminated is the attitude that the war can be won even if coal is not mined at capacity by every opening in the United States.

Roland C. Luther, vice president of Peerless, has summed it up this way:

"The basis of our efforts in combatting absenteeism is the principle of trying to make the men understand how very important their work is in the war effort."

And there it is, right back to the old problem of selling the miner on his vital part in the war. That is as much a problem for Lewis and the United Mine Workers as it is for management and supervisors.

Peerless has tackled the problem this way:

Each man who is absent is interviewed by his foreman as soon as he returns to work. If any method has been found to be universally successful it starts with this step. The foreman, if he is understanding and patient, can learn the cause. If the cause is learned, half the fight is won. That is why it is so important that foremen and supervisors not only understand the problem of absenteeism but be made an integral part of any company program to correct it.

At Peerless, if the worker can give no legitimate excuse, the foreman explains to him how production has been lost as a result of such actions as his and how he is failing his country during the war. Occasional mass meetings are held to drive home this point. Foremen's meetings are held monthly to acquaint them with the facts on absenteeism and labor-management committees meet monthly also to discuss the situation. Production charts showing the daily output and the daily quota are conspicuously placed at the drift mouth and bulletin boards carry the company honor roll, letters and pictures from former employees in the services.

If an absentee persists he is handed a small cartoon, not deriding him but showing how much coal contributes to the war and how much his own effort means in coal production. Next, a personally signed letter from the production manager is sent to him, telling him once more of his part in the war and the importance of getting out all the coal possible. As a final resort, the "shame" approach is used and his name is posted on a "slacker's" list. If all else fails, he is laid off or discharged.

How does the system work? "We, of course, are not particularly pleased with the results of our absentee program," Mr. Luther told **COAL AGE**, "because absenteeism is still a very harmful factor to our continued production. Nevertheless we do feel that by keeping the facts before the men at all times we are gradually making them more conscious of their responsibilities

in the war program and are holding down absenteeism to a lower percentage than might be possible without such a program."

There, of course, is one of the rubs. It is impossible to gage the effectiveness of a campaign against absenteeism because no one knows what would have happened if the program had not been undertaken. But the cold figures still show it is a problem and a big one.

Individual methods are up to individual companies to fit the individual cases. What works in Illinois may be anathema in West Virginia and what fizzled in Pennsylvania may be surefire in Kentucky. But underlying it all is the necessity for an educational program to show the miner his responsibilities as a war worker. Ideally, such a program starts with his fellow workers. But if they cannot be enlisted, then it must start with the face boss and work its way right to the top—and back down.

The quickest and easiest way for that lesson to be taught would be to have John L. Lewis teach it. The miner is essentially as good a patriot, perhaps a better one, than his neighbor. But for years he has followed Lewis's lead, and Lewis has taken no pains to hide his attitude on the war. Oblivious to his own responsibility, he is not going to impress the miners with theirs or at least he hasn't so far. If he won't, then the industry must. It will not be the first time it has shouldered the public responsibilities that Lewis has shirked.

LOADERS GET 360 TONS

In Pillaring With Good Power, Big Cars

Using Track and Crawler Loaders, Princess Dorothy Averages 360 Tons per Machine-Shift—Slate and Bone Cut Out—Using Big Cars and Keeping Voltage at 250 Major Item in Results

By J. H. EDWARDS

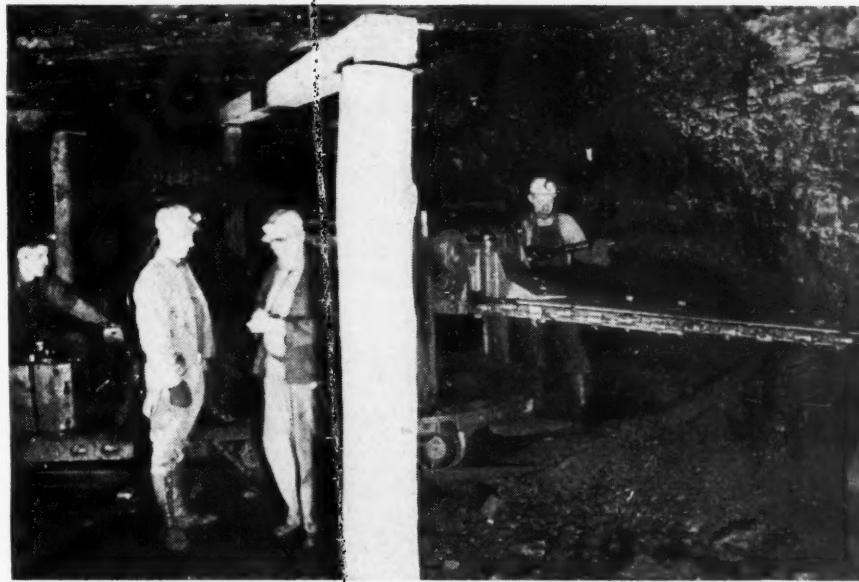
Associate Editor, Coal Age

PURCHASE of new loading machines and large steel cars and rehabilitation of power distribution for full mechanical operation in No. 2 mine were among the first steps taken by the Princess Dorothy Coal Co. after it was organized in 1938 and took over operation of the Eunice (W. Va.) property owned by the C. & O. Ry. As a result, this full-mechanical mine, operating six loader shifts per day and working principally in pillars, is producing 2,200 tons, or 70 percent, of the 3,100-ton daily output of the plant.

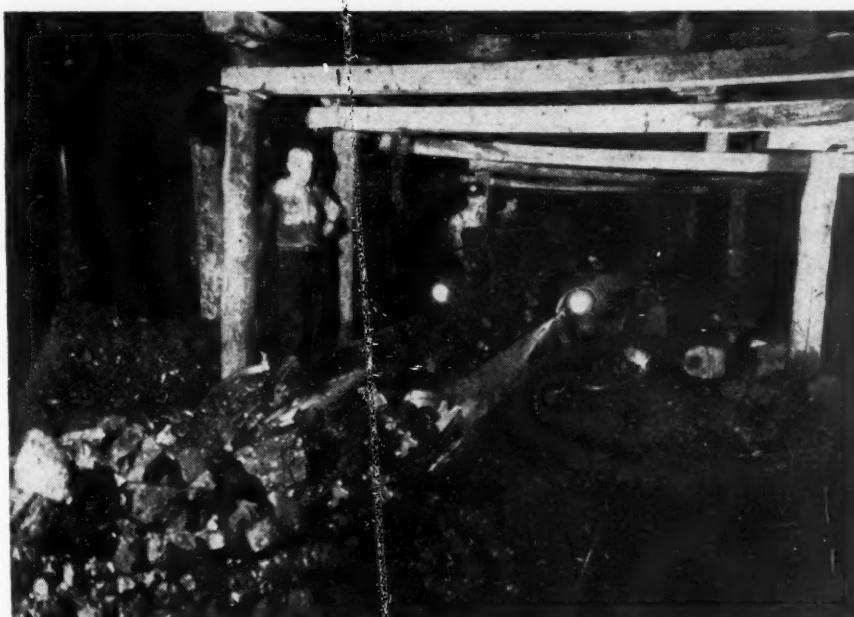
Eunice No. 1 and No. 2 mines are served by one tipple on the Coal River extension, Cabin Creek branch, C. & O., in Raleigh County. No. 1 mine is in the Dorothy seam, 60 in. thick, and is entered by a drift at the head of a rope-and-button retarding conveyor 1,475 ft. long on a 32-deg. pitch. No. 2 mine is in the No. 5 Block seam, 100 in. thick and 368 ft. higher. It is close to the mountain top and thus the coal areas are narrow and the maximum cover is but 150 ft. Cars loaded in this mine are hauled 11,000 ft. (farthest section) to a plane where they are let down on an 18-deg. pitch for 900 ft. and then are hauled 5,400 ft. to the headhouse of the rope-and-button conveyor.

Hard Bone Coal Above

This 100-in. No. 5 Block seam, in which mobile loaders average 360 tons per shift, mostly in pillar work and some in bad-top sections, has a 4- to 5-in. consistent slate parting 3 ft. from the bottom. Above that, in many places, is a 5- to 6-in. layer of hard bone coal. It may be directly above the slate or the two may be separated by 5 in. of coal. Cutting is done in the slate or above and below it and always not less than two kerfs are made



Cutting out 5 in. of bone, 5 in. of slate and 5 in. of coal between, using tipped bits, in robbing a room pillar. In the foreground are (right) L. E. Scholl, general superintendent, and Lotus Lemon, section foreman. John Combs operates the machine and Clayton Stover helps.



Loading out a pocket in a pillar with a track-mounted machine.

to provide expansion for shooting the coal to the best advantage for mechanical loading. For this cutting, the equipment consists of four Goodman 124AA slabbers using Borod-tipped bits.

In some places, where the bone and slate are separated, about 15 in. of the seam is cut out and wasted, and this cutting requires four slices with the cutter bar. In other places, only 3 in. of slate is present and there two cuts are made, one above the slate and the other below. In those places, when the coal is shot, this slate breaks up in large pieces, is loaded out with the coal and picked out at the tipple.

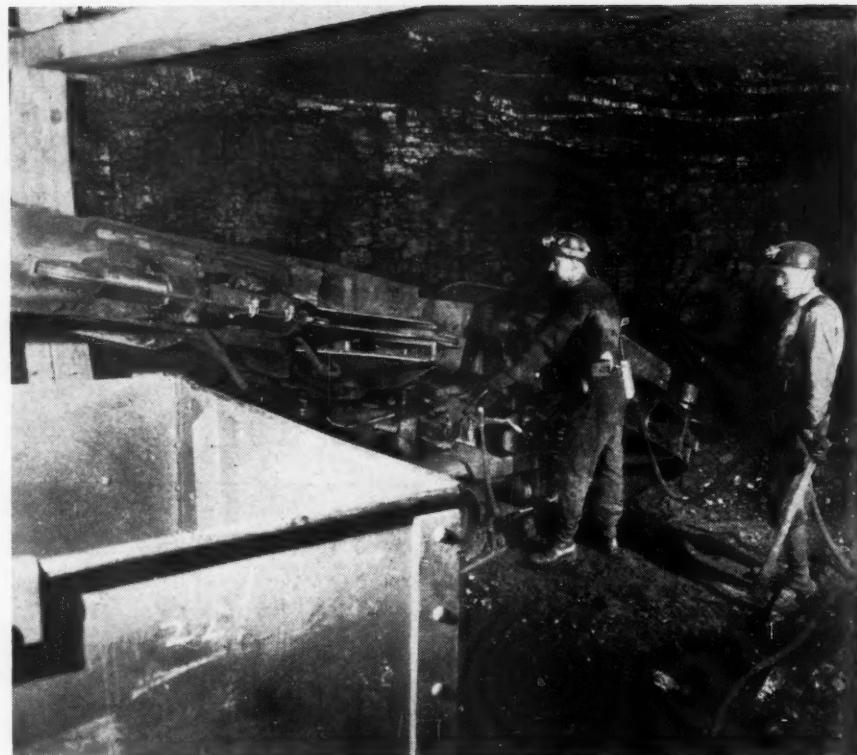
Over a large percentage of the territory, a weak slate caps the coal and there about 18 in. of coal is left up to serve as roof in development work. In a few sections, a strong sand-rock top is encountered and there the whole seam is mined. A large part of the No. 5 Block tonnage is broken with Cardox, using the large No. 231 tube. Only in about 50 percent of the pillar coal is permissible explosive used and that against falls where the Cardox shells might be lost. Drilling for both types of breaking is done with Chicago Pneumatic No. 572 electric drills. Hardsocg augers and bits are in use where Cardox breaking is done, with plain augers for the permissible shooting.

Locomotives Service Cars

Loader equipment consists of two Goodman 360 track-mounted machines and three Joy 11BU crawler-mounted units. At present, three of the five loaders are used on each of the two shifts. Cars are serviced to the loaders by Jeffrey locomotives (one 8-ton and four 6-ton) equipped with General Electric motor-driven cable reels. One or two locomotives are used per loader, depending on the number of working places available to the machine.

Cars carry an average of 5.85 tons and the number in service, handling the 2,100-ton production from this mine, is 150. Of these, 100 were made by the American Car & Foundry Co. and 50 by the Watt Car & Wheel Co. They have 16-in. wheels with Timken bearings and on the link end have double-action spring bumpers, single action on the other end. Rails on the main lines are 70-lb.; on the flat entries, 56-lb.; and in rooms, 45-lb.

Rooms are driven 26 ft. wide on 70-ft. centers, 400 ft. deep. Five cross bars (wood) are used over the loader at each face, thus complying with a regulation of the state mining department. Pillars are mined by slabbing and pocketing and the total recovery is calculated at 91 percent.



During the shift when this illustration was made, this crawler-mounted loader handled 484 tons of coal in addition to the cuttings. Since its purchase in January, 1940, it has loaded 950,000 tons without an overhaul.

◀ This 60-kva. capacitor near the No. 2 mine shop is one of three installed to improve the power factor and afford better a.c. voltage regulation.

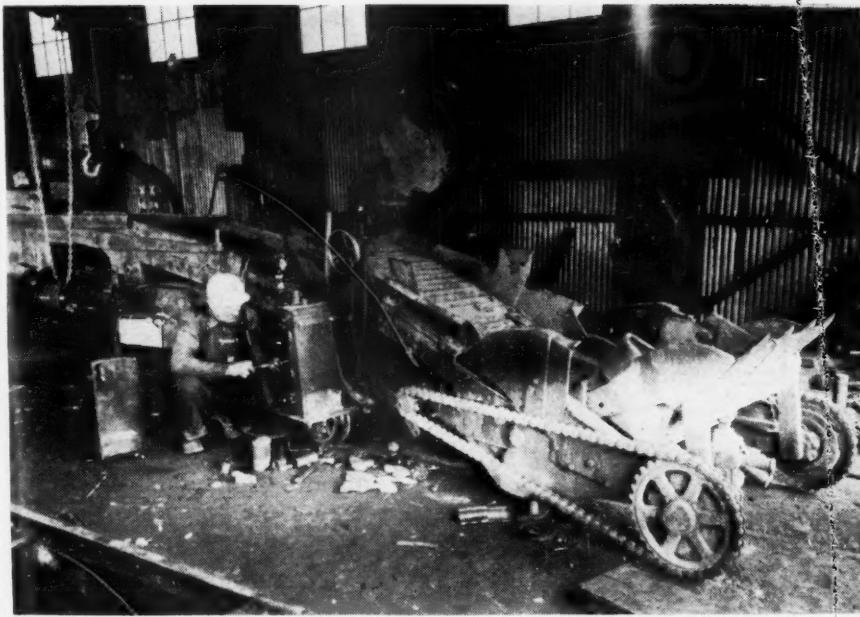
Sixteen men comprise a loader crew, which includes motormen, cutters, timbermen and trackmen. Each crew is under a section foreman whose duty is to see that his machine produces a maximum tonnage with a minimum of lost-time injuries to the men. A typical average for recent months has been 360 tons per machine, equal to 21 tons per man-shift delivered to the main haul. One machine working four places in sand-rock top produced 520 tons during one shift, equal 30 tons per man-shift.

Many steps have been taken at Eunice to supply good voltage for the primary reason of avoiding delays to men and machines. That this good power also pays dividends by reducing total energy cost is indicated by the unit power consumption for the two

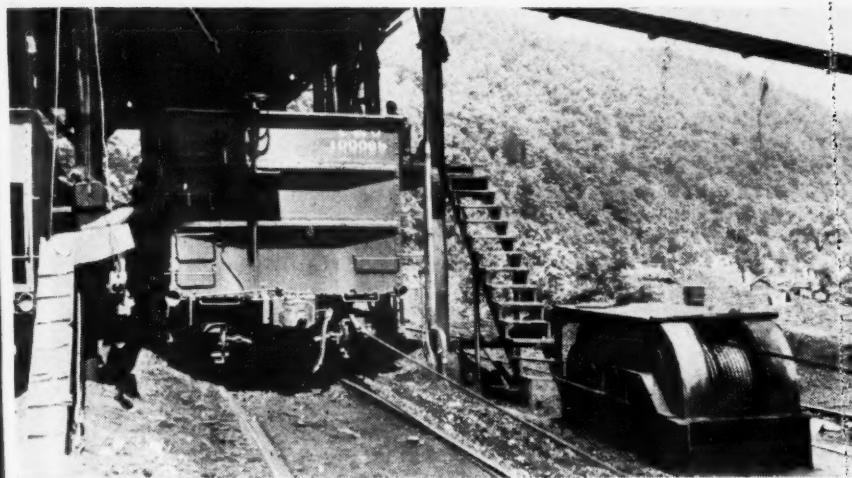
mines. For the first seven months of 1943, during which time 576,000 tons of coal was shipped, the power consumption was 3.51 kw-hr. per ton. In comparison, the average for West Virginia mines of about the same tonnage capacity is around 5.5. Thus, Eunice mines use but 56 percent of the average. Fifteen-minute average demand for the operation during that same period was 944 kva.

Little Voltage Lost

Power is purchased and the d.c. substation voltage is adjusted to 290. By ample copper and close attention to bonding, the bogey is a voltage of 250 or better at the end of the trolley line. In few cases have tests revealed working voltages as low as 230. The management has set one mile as the ordinary m but is porarily substati In bu pany ha 400,000 ruptions wires ar in the su lators at tions, the feeder m eering lo and m in the t Hand ducing m where t changes of this t kva. (C



Rebuilding a veteran for loading rock in Eunice No. 1 mine.



New larger-capacity layer-loading hoist loads slack cars with a uniform mix.

maximum for d.c. transmission but is now doing some mining temporarily 6,200 ft. from the nearest substation.

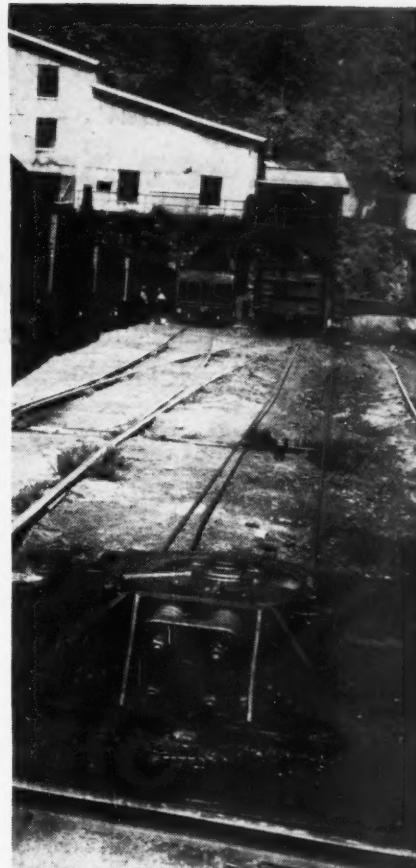
In buying new trolley wire, the company has purchased only No. 9 section 400,000-cir. mil. size. To reduce interruptions, the main-haulage trolley wires are fed from separate breakers in the substations, by the section insulators at the entrances to working sections, the trolley wire and machine feeder are in parallel. Thus, the gathering locomotives, mining machines and mobile loaders are on the feeder line, which also has its separate breaker in the substation.

Hand-in-hand with this plan of reducing interruptions and keeping them where they belong are a series of changes in the substations (see p. 56 of this issue). Capacitors totaling 180 kva. (Carnell-Dubilier Electric Corp.,

South Plainfield, N. J.) have been installed at three points on the 4,160-volt distribution for the two mines. One 60-kva. unit is at the tipple, another near the No. 2 shop and a third at a rotary-converter substation feeding the most distant section of the mine.

Bigger Hoist Installed

The No. 5 Block and Dorothy coals are mixed at the rotary dump at the top of the rope-and-button conveyor. A recent improvement at the tipple was the installation of a larger Brown-Fayro layer-loading hoist (Model HKI) to replace a smaller unit. This assures uniformity in loading the mixed coals. The tipple operates two seven-hour shifts, as do the two mines. No. 1 mine, with the thinner coal and more difficult roof, is on hand loading but the over-all productive efficiency



Spring-anchored sheave installed with the new layer-loading hoist increases rope life many times.

of this Eunice property is 7.11 tons per man-shift, including all inside and outside men except employees of the store and men engaged in maintaining company houses.

A veteran Myers-Whaley loading machine was completely overhauled in the No. 1 shop recently to handle a job of loading about 1,500 cars of rock where top must be taken in No. 1 mine to replace decayed timbering. The job also involves making a temporary haulway around the section to be retimbered. This is one of three machines purchased by the C. & O. in the period between 1926 and 1929 and which were double shifted for many years, loading both rock and coal. The maintenance record of those machines was detailed in the article "Four Years of Mechanical Loading," *Coal Age*, November, 1929, p. 675. Repair costs at that time averaged less than 4¢ a ton.

H. D. Everett, Charleston, W. Va., is president of the Princess Dorothy Coal Co., and Andrew Hogue, Mahan, is manager. At Eunice, L. E. Scholl is general superintendent, R. T. Armstrong is general mine foreman and C. C. Peters is chief electrician.

CONVERTER SUBSTATION

Fitted for Selective Protection, Safety

Two Networks From Three Substations Supply Two Mines—Complications Exist in One Two-Unit Substation With Different-Sized Machines—Interruptions Are Reduced and Troubles Kept at Home

By J. H. EDWARDS

Associate Editor, Coal Age

"To reduce interruptions and keep them where they belong" was the brief explanation given by L. E. Scholl, general superintendent, Princess Dorothy Coal Co., Eunice, W. Va., for a number of "gadgets" that Chief Electrician C. C. Peters and his assistant, Ralph H. Stewart, have added to a two-unit converter substation. This substation is manually started but is equipped with automatic reclosing breakers on the outgoing feeders. At this property, two mines deliver to one tipple and the No. 2 mine, producing 70 percent of the total tonnage, is operated with mobile loaders. The management considers good power a top factor in efficient operation.

Two Have Single Units

Three 275-volt d.c. substations situated far apart, at different levels and operated in parallel, supply the two mines, which are drifts on a mountain-side and in seams separated by an interval of 368 ft. All substation units are synchronous converters and two of the substations have but single units, each of 300-kw. capacity. The other substation, known as Elk Run and having two units (one 200-kw. and one 300-kw.), has been fitted with protective devices to handle every situation. It is at the foot of an outside plane down which cars are brought to the lower level from the mechanical-loading operation in the higher seam (see p. 57 of this issue).

Three feeders, each equipped with an automatic reclosing circuit breaker, distribute the d.c. power from this substation. One supplies the trolley of a 5,400-ft. main haulage line to the headhouse. Another supplies Elk Run drift section of the lower (No. 1) mine and the third branches to the

upper seam (No. 2 mine) over two feeders reaching that mine at points 2,000 ft. apart.

In the central portion of the wiring diagram (Fig. 2), the main bus arrangement was changed to add the bus divider switch and two total-overload relays. These relays are in parallel only because relays of but half the desired capacity were available. Ones of double

the rating would have been connected in series.

Assuming peak loads of 700 amp. to Elk Run, 500 amp. to No. 5 Block (No. 2 mine) and 1,400 amp. to the main haulage, holding coils of the reclosing breakers are in series with certain contacts as follows: Elk Run, with the total-overload relay set to trip at 1,400 amp., and No. 5 Block, with the

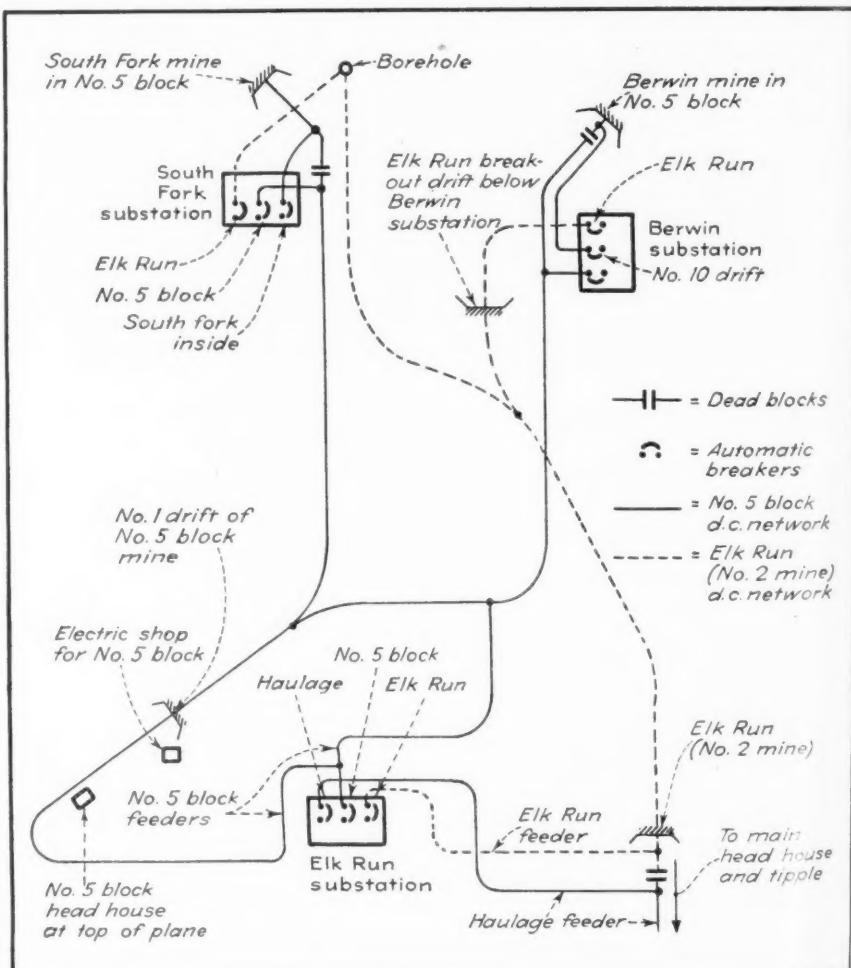


Fig. 1—D.c. feeder system at Eunice Nos. 1 and 2 mines. Service to either No. 5 Block or Elk Run networks can be completely interrupted by a dead short, in which case the shorted network is isolated automatically while service to all other sections goes on.

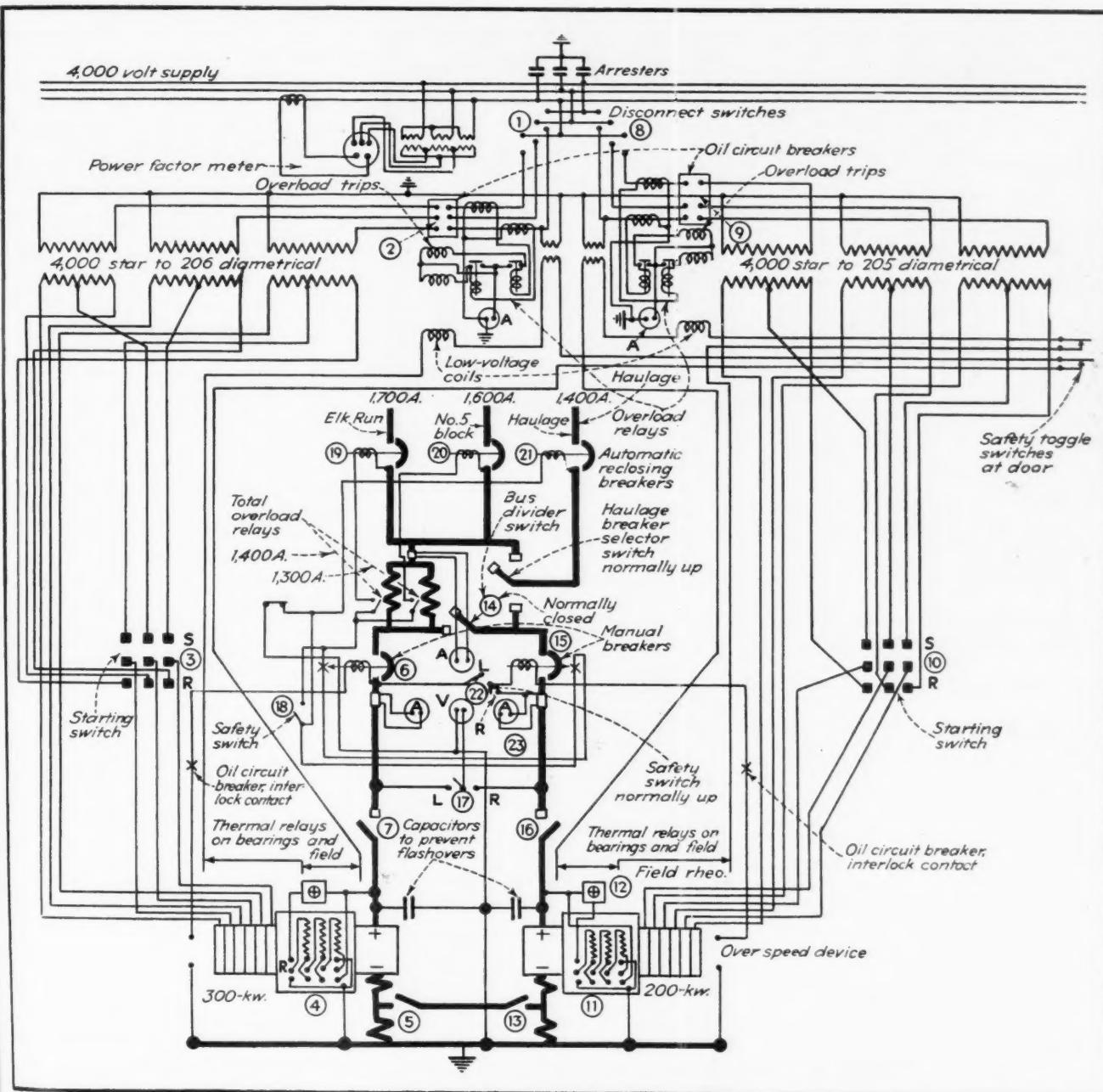


Fig. 2—Diagram for the two-unit Elk Run substation, including protective features and numbers to which the operating instructions refer.

For the benefit of new men who may be called upon to start, stop or otherwise care for the substation, a diagram which includes the section here reproduced is posted on the wall near the control board. This can very well save damage to equipment, injury to an operator and prove invaluable in an emergency. The instructions are:

To Start Elk Run Substation and Parallel 300- and 200-kw. Converters:

Close disconnects No. 1.
Close oil switch No. 2.
Close starting switch No. 3 to S position.
Check polarity.
Close No. 17 to L.
Close field switch No. 4 to R.
If voltage is right, throw switch No. 3 to R.

Lower brushes.
Close equalizer No. 5.
Close manual breaker No. 6.
Close main d.c. switch No. 7.
Close disconnects No. 8.
Close oil switch No. 9.
Close starting switch No. 10 to S position.

Throw No. 17 to R.
Check polarity; if right, close field switch No. 11 to R.

Change starting switch No. 10 to R.
Lower brushes.

Check voltage with No. 17 and adjust with No. 12.

Close No. 13 equalizer.

Close No. 14 bus-bar switch.

Throw safety switch No. 22 to L.

Close No. 15.

Close main d.c. switch No. 16.

Adjust No. 12 rheostat for zero reading of ammeter No. 23.

Close automatic breakers Nos. 19, 20 and 21.

Close safety switch No. 18.

To Shut Down 200-kw. Converter:
Open automatic breakers Nos. 19, 20 and 21.

Open manual breaker No. 15, open equalizer No. 13.

Open oil switch No. 9.

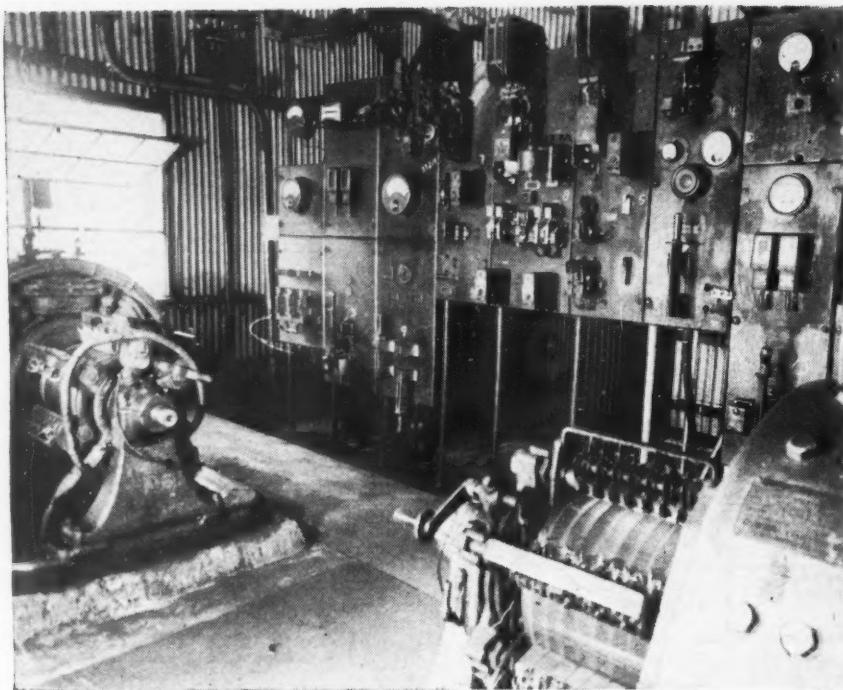
When voltage comes to zero, open No. 10 and No. 11.

Open disconnects No. 8.*

Open No. 22 and 18.

Reclose automatic breakers Nos. 19, 20 and 21.

Open bus switch No. 14 (only necessary for complete isolation of the 200-kw. converter).



Two converters supply the d.c. and three automatic reclosing breakers dish it out.

total-overload relay set to trip at 1,300 amp.

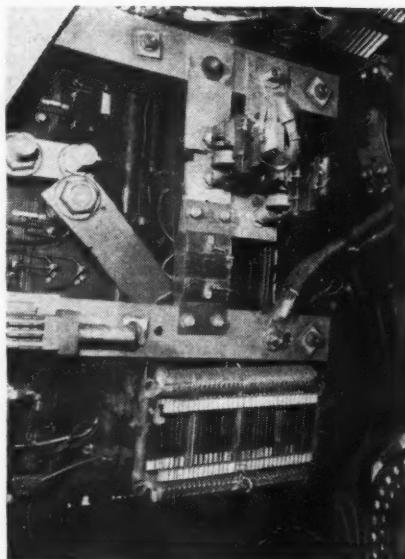
When the total peak load reaches 2,600 amp., the total-overload relay at the right trips and opens the automatic breaker to No. 5 Block mine. This mine, however, is still supplied from other substations. To these sections, an interruption of power causes the least loss of production. If the peak moves up to 2,800 amp., the other total-overload relay opens the No. 1 mine breaker, still leaving No. 2 mine supplied from the South Fork substation through the borehole but giving over the whole capacity of this Elk Run substation to the main haulage age.

Provide for Big Loads

In case of an abnormal or unusual period of peak loads which would cause pumping of the reclosing breakers, the haulage-breaker selector switch can be thrown temporarily to the bottom position, thus taking the haulage load off the total-overload relay circuit.

Holding coils of the manual circuit breakers of each machine are in series with normally closed contacts interlocked mechanically on the respective oil circuit breakers. This arrangement serves in place of reverse-current relays to protect the individual machines against overspeed by motoring. If, through overload or a.c. voltage failure, an oil circuit breaker opens, that opens the manual d.c. breaker of that converter.

To prevent overloading the smaller unit during parallel operation in case



Two totalizing relays are in parallel and thus operate when the total load is twice the individual setting.

the larger should stop, Safety Switch No. 22 was added. Normally, with this switch in L position, the holding coil of the smaller unit's manual breaker is excited from the other machine. For single-unit operation, Switch No. 22 is thrown to the R position.

Another safety switch (No. 18, left side of the diagram) has the function of shorting out from the circuit of the No. 19 and No. 20 automatic-breaker holding coils the two contacts added as interlocks on the manual breakers. With one-unit operation and this switch open, tripping of either of the

manual-breaker armatures would open the No. 19 and No. 20 automatic breakers to remove the principal load and thus protect the remaining single machine. For parallel operation this switch, No. 18, is closed.

With Bus Divider Switch No. 14 open and the haulage-breaker selector switch in the lower position, the haulage can be operated separately on the 200-kw. converter.

After an experience in this substation when the 4,000-volt oil switch nearest the door caught fire and made it dangerous for anyone to enter the building to trip off the machines, the safety toggle switches shown at the upper right in Fig. 2 were added. These switches are on the wall just inside the door where they can be reached without entering. They open the a.c. low-voltage coil circuits and thus trip the oil circuit breakers.

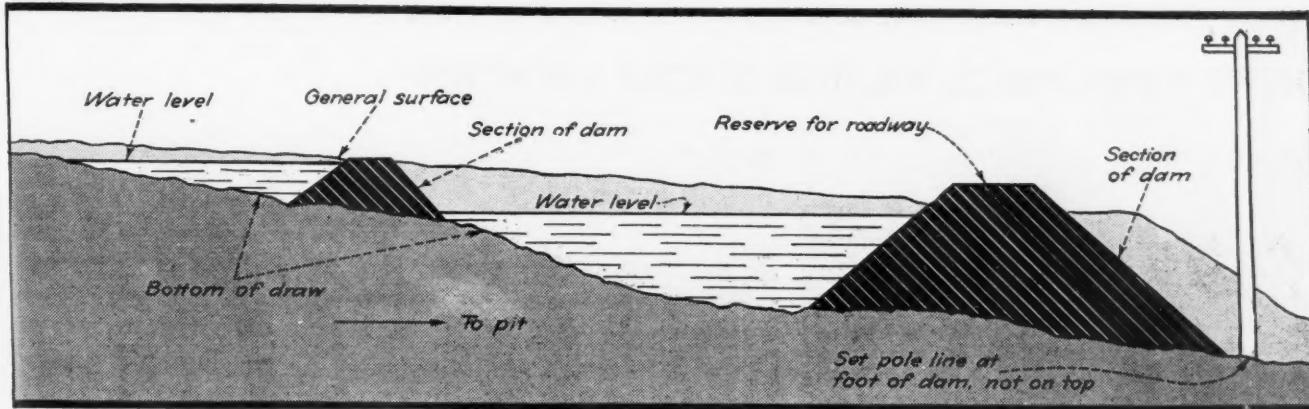
Because the substation is close to the bottom of the car plane where men are working during the two operating shifts and available to it in case of trouble, the substation is operated without a regular attendant. Thermal relays at bearings and in the fields shut down the units in case of overheating.

Ample Copper Used

As is the case with all three substations, the feeder to the trolley wire at this Elk Run substation is not connected close to the substation but instead this connection is made 500 ft. away, this to introduce some resistance to lessen the severity of a short if occurring on the trolley line close to the substation. The insurance company which inspects these substations requires a distance of at least 300 ft.

At this mine, ample copper in trolleys and feeders is considered an excellent investment toward maintaining tonnage and although the operating layout has made it advisable temporarily to transmit d.c. 6,200 ft. in one section, the operating voltage is kept generally at 250 or above at the ends of the trolley wires. One mile is the normal limit for d.c. transmission at the mine. A voltage of 230 is considered very low and deserving of immediate attention. Substations are adjusted to 290 volts. The cutters, loaders and cable-reel service locomotives on a working section are separated from the main haulage trolley circuit; that is, are powered through a separate automatic breaker.

The two synchronous converters of the Elk Run substation are General Electric Type HCC and all three of the automatic reclosing circuit breakers are I-T-E Type KSA. Their ratings are 1,000 amp., 1,600 amp. and 2,000 amp.



This catchbasin arrangement is the result of years of experience in keeping surface water out of the pit. Water may be pumped over the hill with a portable pump. Location of road and pole line are important.

HANDLING WATER

To Save Time and Money at Strip Mines

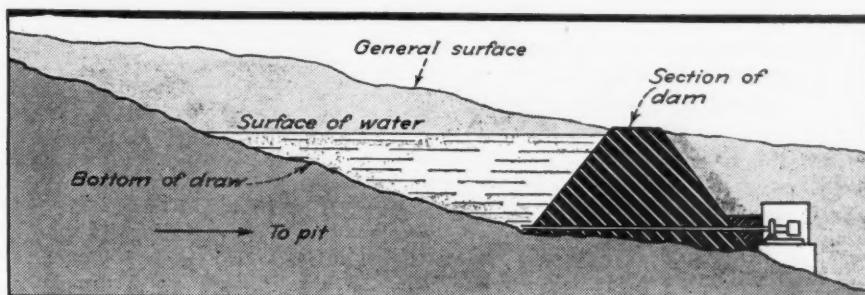
Contour Map the Basis of a Good Drainage System—Making Maximum Use of Natural Waterways a Money Saver—Catchbasins Help in Many Cases—Right Location of Pumps Facilitates Pit Work

By **FRED W. RICHART**
Assistant Editor, Coal Age

IN THE PAST 25 years the trapping of storm water and the drainage of strip mines has passed from the guessing stage to mature judgment and engineering exactness. Today, a complete land and profile map, on which logs of prospect holes and coal contours are located, is the customary basis for pit layout and drainage systems.

Twenty years ago an underground coal operator transferred his allegiance to strip mining. The summer was long and hot and dry. There was no need to worry about water—except for its lack. Only two or three small pumps were on the job. With the coming of fall the pit was well opened up and producing. Despite warnings that dry spells always ended with a rain, still nothing was done about it.

Finally, clouds appeared on the horizon and one night the storm broke loose. Wind and rain and lightning lashed the face of the earth. The next morning the stripper was in water up



Permanent pumping installation to serve a large catchbasin with a long life, discharge pipe to lead to drainage ditch or other outlet. The pump house is frostproof or heated with electric space heaters. The suction pipe is banked with earth. One company makes pump houses of concrete.

to the cab. The loader was almost submerged. Strawboss stockholders were in a panic. But the manager, with his genuine Scotch aroused, rounded up the necessary pumping equipment and dewatered the pit. Disasters like this are tough but effective teachers.

Involved in strip mine drainage are all the plans for developing the mine. Since the vein of coal and the contours of the surface are never duplicated, drainage is a problem to worry the experienced engineer. With no strip-mine experience he should be

doubly watchful and still hope his errors may not be disastrous.

In outlining a stripping area and locating the box cut, drainage ditches, pumping stations, haulageways and preparation plant, the engineer will draw on the successes and failures of neighboring operations but rely largely on his personal experience and judgment. Every bit of information may have some influence on the development of a new mine or the extension of a property that is partly mined out. Strip-mining machines and methods

HOW STRIP MINES HANDLE WATER PROBLEMS



1 Shallow ditch made with a road patrol.



2



3

2 Six-foot concrete tile replaces trestle for rail haulage line. Trestle, in the rear, was rotting down. This tile culvert is 100 ft. long and extends under a second trestle now building. The track was torn out, a ditch excavated with a dragline, tile laid, ditch refilled and track relaid over a week end with no loss of mine time.

3 This cable horse is made of approximately 4-in. pipe and carries both electric cables and water over the roadway. Note discharge-hose connection at right.

1

change so rapidly that what is orthodox today may be passé tomorrow. But there are some fundamentals that do not change.

As one practical operator summed it up: "Failure to arrange proper drainage can be one of the most expensive items around a strip mine. All ditches and other drainage projects should be taken care of in the summer when sunshine and weather are favorable.

"When a drainage ditch is opened up ahead of the high wall laterals are run from near the pit to the main ditch, if it can be done, to save pump discharge hose. It is frequently necessary to make a series of parallel drainage ditches instead of a single ditch.

Surface area is what catches the rainfall. Ten acres may have little effect but 300 acres of surface may cause a flood in the pit.

"When feasible, the box cut should be opened parallel to surface drainage lines. That makes it easier to divert storm water away from the pit."

When strip-mine acreage has been rounded out the worries of the engineer begin. Land lines must be established, natural waterways, country roads and bridges surveyed, and contour lines run. Contours usually are run on 5-ft. intervals. Work will be saved by basing levels on the sea elevations of government bench marks found in most localities. These data

are recorded on the mine map, together with coal contours determined by prospect drilling. The map is now the basis for setting up the sequence of mining the various sections into which the property may be divided for operating convenience.

Weather Is A Factor

The size and shape of each section to be mined and the order of mining will depend on existing conditions. It is at this point that judgment based on experience counts heavily. Strip mining is so different from deep mining that much of the experience in one is of little help in the other. For example, erratic weather is a constant

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4



4 Surface sump and pump house. At the far end are a contour surface ditch and a deeper ditch which brings in water from the pit pumps.

5 Discharge of sump pump into ditch leading to a natural waterway.

6 Culvert carries water under roadway at end of ditch. Ditch and culvert carry water beyond the high point of the surface to natural drainage.



5

menace to strip operations. Wet and dry seasons, mud and dust, hot and cold days, wind and lightning set up hazards which may stop production or injure a man. Engineering knowledge is essential but there is no substitute for experience in reaching workable decisions.

Terrain is the governing factor in planning surface drainage. Whether level, rolling or hilly or sloping toward or away from the working cut determines what must be done. As stripping proceeds, conditions are likely to change, setting up new problems, sometimes reversing procedure. Whatever the final plan, natural waterways on the property should be used until

they interfere with stripping. They may then be left intact or shifted to new locations depending on the size and the coal involved.

Drainage Water Used

Most strip mines require washeries to produce coal with acceptable ash and heating values. Numerous mines have unstable water supplies for washing coal. Some operators have taken advantage of a well-developed drainage system to collect and conserve water for that use, using a system of cascaded ponds and connecting contour ditches. The rate of flow from pond to pond is controlled by valves or exit pipes. At other mines the final cut of a section

is used for impounding rainfall or drainage water for washery supply.

The diversion of storm water will be a natural if the terrain slopes away from the box cut in the direction the coal is to be worked and the flow is to a natural waterway. In the event the opposite condition exists, a large ditch or series of parallel ditches is dug far enough back from the box cut to permit six to twelve months' stripping and near enough to prevent much storm water from reaching the pit. To reach some natural stream, ditches may have to be cut through rising ground where 20 or 30 ft. of digging is necessary. In a series of ditches, they usually are 300 or 400 ft. apart

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and extend far enough from the working cut to carry production into the next dry season.

The area between the nearest storm ditch and the working cut will drain into the pit, from which it must be pumped. That condition may be improved where draws or ravines drain a considerable area by building a dam across the lower end or a series of dams to form catchbasins. Accumulated water may seep into the pit or be pumped "over the hill."

One objection to catchbasins is the boggy condition where water has stood for a time. This makes trouble for heavy high-wall drills where they must be used.

Even with storm water headed off there is always enough water reaching the pit to require considerable pumping equipment. In numerous instances there has been enough rainfall in a brief time to drown out the operation. Long spells of dry weather have caught new operators napping. Rain always comes. Being prepared for a flood is a fortunate thing when a storm hits.

Natural drainage of a pit is rare but it happens on occasion. Sometimes streams are below the coal level. Even with that good luck some pumping equipment is likely to be necessary, for the coal seam is rarely level or uniformly pitched. There are many reasons for a dry pit, such as safety, comfort and ease of manipulating machines. Even continuous seepage from a porous spoil bank can be almost as much of a nuisance as a rain.

There are numerous ways of solving particular drainage problems. Low, abandoned pits may be kept dewatered by pumps mounted on rafts and automatically controlled by the water level if desired. An open flume, reached by

a short vertical discharge pipe, is one means of saving vital war material where several hundred feet of pipe might normally be needed. Another device is a sizable sump at the foot of the entrance ramp. A pump set here for the life of the pit will take care of water entering from that direction. Quite small portable pumps are used to handle seepage and light rains.

One of the special problems, which is often difficult to solve, is drainage adjacent to alien property lines. Land owners frequently refuse to cooperate. It may be necessary to build a reservoir and establish a permanent pumping plant if natural drainage is upset by mining operations.

New Clutch Design

A small diesel-driven dragline is the usual ditch digger. There is always the possibility that drainage ditches must be dug away from the working area of the pit and out of reach of power lines. Machines of this type vary from less than a cubic-yard capacity on up. The larger machines also are used for stripping, moving back spoil, road grading or as cranes in construction. An objection to diesel-driven draglines is the toggle clutch that is either "on" or "off." A recent design of air clutch, applied to a 3-yd. dragline, permits easing into action with slip, like an automobile clutch. The owners are pleased. Its use is likely to grow.

Other tools useful for drainage work are the road patrol and the bulldozer for making shallow contour ditches, and the wheeled scraper and similar equipment for building dams. Two days with a wheeled scraper will build a dam that would take two weeks with teams. Such speed may be important. Most power tools used at strip mines

are suitable for numerous odd jobs.

Every strip pit has several portable centrifugal pumps mounted on skids or wheels which may be quickly moved from place to place with tractors or trucks. They are driven by electric or gasoline motors, depending on where they are to be used. Each is equipped with its own suction hose, perhaps also with its discharge hose. A priming device on each pump is becoming the fashion. They save time and annoyance. There are a number of self-priming pumps on the market which have built-in priming tanks that must be drained in freezing weather. Moderate speed pumps (900 and 1,200 r.p.m.) have the advantage of large ports for the water flow. They do not clog up with fine coal and refuse as readily as 1,800- and 3,600-r.p.m. pumps with small ports.

The stripping industry is finding out that every outdoor pump motor should be splash- or weatherproof and its control also weatherproof. They have longer life and give far less trouble. Storm conditions are not satisfactorily met with hoods made from a half oil barrel. Motors should be protected with circuit breakers rather than fuses. That eliminates the possibility of motor burnouts by single phasing.

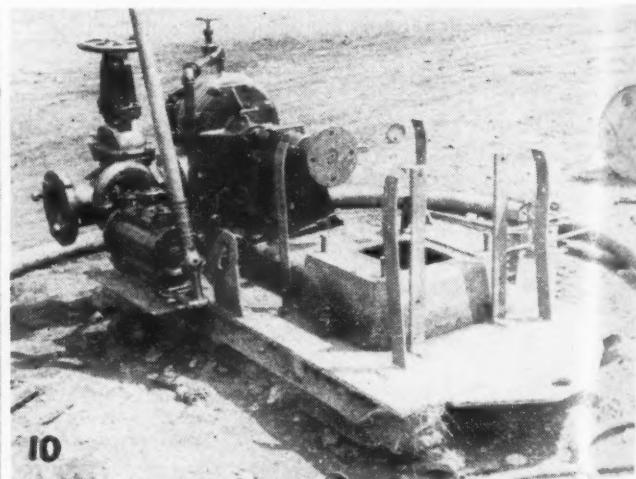
Some mines are able to work out locations for a central pumping plant in the pit or on the surface. Pumps as large as 10- or 12-in., driven by 60- to 125-hp. motors, are occasionally used. Spirally riveted steel pipe, light weight and not expensive, is often found in present-day pits.

A dry strip pit is a long stride toward continuous production and satisfactory profit. It is within the reach of every operator and it makes a favorable showing in the cost sheet.

PORTABLE PUMPING RIGS FOR STRIP MINES



LEFT—Wagon-mounted 50-hp. centrifugal pump. The splash-proof motor and weatherproof control are standard at this mine,



even for smaller pumps. RIGHT—Sled-mounted pump (motor off for repair), showing permanently connected tank for priming.



Fig. 1—Inby section of Blocton No. 9 mine. Active at present are the cross entries farthest inby: 9th, 10th and 11th South on the left and 10th and 11th North on the right.

MORE SHAKERS

Included in Changes to Boost Tonnage

Fourteen Shaker Conveyors Employed in Room Mining and Driving Aircourses at Blocton No. 9—Rope Haulage and Equipment Underground on A.C.—Five Years With Shakers Prove Low Maintenance

THAT SHAKER CONVEYOR mining has proved its efficiency in the 5-in. Woodstock seam at Blocton No. 9 mine, Bibb County, Alabama, is indicated by a recent acquisition of several more units, thus boosting production to 900 tons per day, and also by improvements in washing and screening and loading facilities, installation of a larger hoist and a project now under way to install larger mine cars. In this operation of the Black Diamond Coal Mining Co., experience with shakers has demonstrated the practicability of using pan lines as long as 450 ft. Therefore, to secure the maximum possible tonnage per set-up of room conveyor, the mine

projection has been changed to increase centers distance between cross-entries from 420 ft. to 460 ft. Rooms are driven only on the upper, or aircourse, side and their pitch in favor of the load is 8 deg.

This mine, on property of the Tennessee Coal, Iron & R. R. Co., was leased and reopened by Black Diamond five years ago after a shutdown of 19 years. Except for the original rails, the mine was completely equipped inside and out (Coal Age, May, 1940, p. 47). The workings are on the west side of a synclinal basin and the seam pitch is 10 percent to the southeast. The mining is now advancing down into an area below the

worked-out Thompson seam, which is 400 ft. above it and full of water. The Woodstock coal in the present Blocton No. 9 workings ranges from a few inches to 60 in. in thickness, is devoid of regular partings and is topped by 4 in. of rash which comes down with each cut. Above the rash is a firm slate ranging up to 5 ft. in thickness and the stratum next above that is a massive sand rock. Only traces of gas have been encountered in the mine.

The main slope consists of three sections. One straight section, the "Black Slope," average grade 8 percent, is 7,000 ft. long. Haulage on the 3,500-ft. section outby is handled in 18- to 20-car trips by a 350-hp. elec-

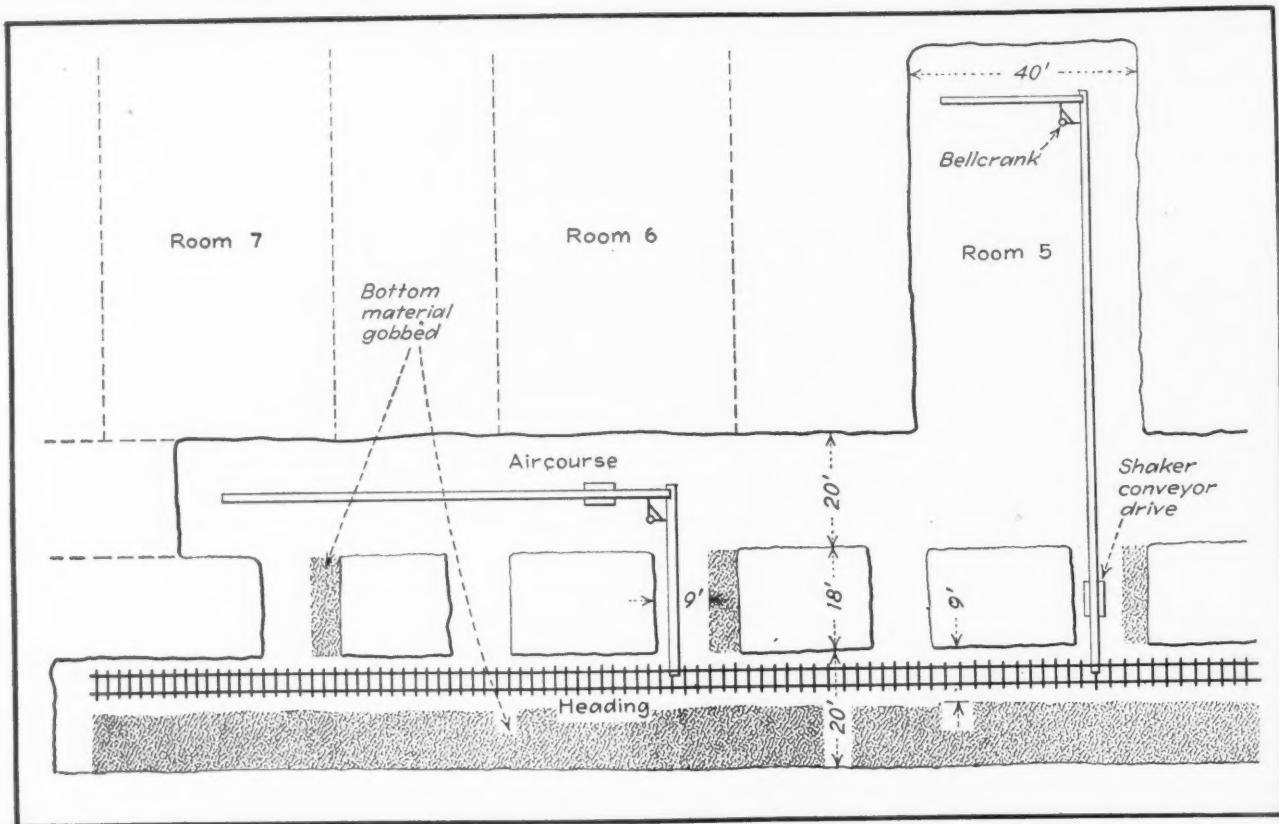


Fig. 2—How a room and aircourse are mined with shaker conveyors.

tric hoist installed underground and equipped with 7,000 ft. of $\frac{1}{2}$ -in. rope. The speed over this main section is normally four trips per hour but the record pull in seven hours is 32 trips. Haulage on the outby section, the "Front Slope," length 450 ft., grade 5 percent, is handled in 6-car trips worked in balance by a 200-hp. single-drum hoist, on which the loaded rope wraps into the groove vacated by the outgoing empty rope. This hoist, a Vulcan unit with General Electric 2,300-volt motor, was installed two years ago to replace a smaller hoist using a single rope. At a point 1,350 ft. from the bottom end of the main slope a sinker hoist is used to handle the cars from that section and also from a third section turned off at 40 deg. to the left, looking down the dip, and now 1,000 ft. long. It is termed the "New Slope." The driving of both slopes is being continued.

Five other electric hoists serve an equal number of active cross-entries, three on the left and two on the right. Whereas the old cross-entries have grades up to 4 percent, the newer ones, 11th South and 11th North, are on 14 percent. Maximum length of future cross-entries will be 4,000 ft. and the minimum 2,000 ft. One thousand feet further development of the New Slope will bring the mining to the bottom of



Loading onto a shaker conveyor at the face of a room.

the basin and that point will be approximately 8,000 ft. from the main slope portal. The leased acreage indicates a remaining life of 30 to 35 years.

In territory higher in level than the water standing in the worked-out overlying Thompson seam, rooms in the Woodstock are driven 60 ft. wide on 85-ft. centers. Below the water they are narrowed to 40 ft. and driven on 70-ft. centers. Pillars are not recovered.

In the cross-entry layout (Fig. 2), the heading at the lower elevation is termed "the heading" and that paralleling it on the high side is the aircourse. The heading, which is tracked, is driven 15 to 20 ft. wide and has 30 in. of top brushed, as an average, along its upper rib for a width of 9 ft. This waste material is gobbed along the lower rib. Width of the aircourse, from which the rooms are neared full



The track at the left, on which a loaded trip is going up, was added and the dump house widened to accommodate a second rotary dump. Left to right are David Pickett, superintendent; C. S. Blair, vice president and general manager; and Herman Shamblin, assistant superintendent acting as outside foreman.

tion being provided by blower and tubing. The aircourse is driven by a shaker conveyor with its drive on the main pan line and a bellcrank section delivering at 90 deg. through the breakthrough to cars on the heading. Fourteen 10-ft. pans constitute the usual maximum installed ahead of the drive before the latter is advanced to a new set-up.

Crew of Four Does Job

With the 4 in. of top rash down, average working height in rooms is 36 in. The face conveyor, 25 ft. long in a 40-ft. room and consisting of two 10-ft. and one 5-ft. pans, is driven by a bellcrank operated by the end pan of the room unit. The use of a 25-ft. conveyor in a 40-ft. room leaves $7\frac{1}{2}$ ft. at each rib for turning the mining machine. Each room has a crew of four men, one working at the conveyor discharge (car-loading point on the heading) and the other three at the face. Most of the drilling is done electrically. The coal is shot with du Pont Lump Coal CC and the rock with Monobel B. Room posts are set on 3-ft. centers.

rolls because there is less tendency for the pans to buck up. Maintenance cost of shaker drives has been very low. Of the ten which have been in use five years, only two have needed repairs which required bringing the drives to the outside shop.

The mine operates two shifts and a total of 253 men are employed to mine, transport, prepare and ship the 850-tons-per-day output—a performance of 3.36 tons per man-shift. Of the total men, 225 work underground and 28 on the outside.

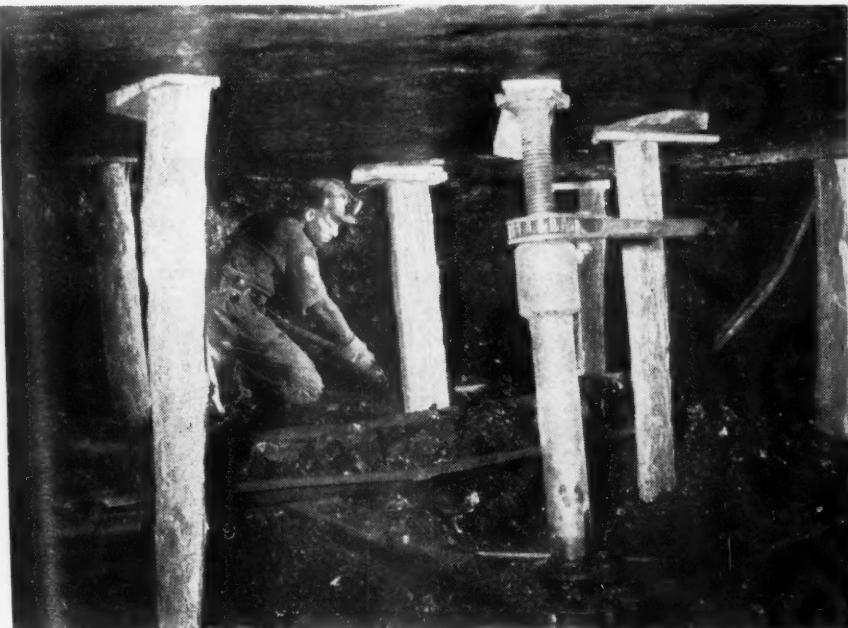
Rail weights on the underground haulages are 40-lb. on the main slope and 30-lb. on the cross-entries. All turnouts are No. 4. Because no locomotives are used in the mine and all underground equipment is powered by alternating current, rails are not bonded. Five underground hoists serve the active cross-entries. Mine cars, 250 in number and built of wood, solid body, with swivel couplings, handle, as an average, 2,700 lb. net of washed coal.

Conveyors, cutting machines, drills, cross-entry hoists and pumps (only two small ones in the mine) are driven by 220-volt motors. The power is taken into the mine at 2,500 volts through a borehole by a 4/0 lead-sheathed cable on which the connected load is now 445 kva. Motors of the hoists operating the rope haulages on the front and back slopes are 2,300-volt. The energy is purchased from the Alabama Power Co. and the over-all consumption, underground and outside, has been averaging 8.66 kw-hr. per ton during months of full-time operation.

480 Tons a Day Washed

On the front slope, a second hoisting track was installed and the dump house widened to accommodate a second rotary dump. To the railroad car loading facilities (four-track tipple), a third loading boom was added. Washing facilities have been changed materially. Only one of the two original Elmore-type jigs is now in use and that is confined to washing $4 \times \frac{7}{8}$ -in. Six new Deister Concentrator Co. SuperDuty diagonal-deck tables were installed to wash the $\frac{7}{8} \times 0$ -in. Each is driven by a 3-hp. General Electric Type K sleeve-bearing motor.

Output of washed $\frac{7}{8} \times 0$ -in. coal is about 480 tons per day. Thus, each table is worked at the low rate of 10 tons per hour. Decks of these tables are natural rubber and their riffles are cemented on, a method of fastening suggested by Herman Shamblin, assistant superintendent acting as general outside foreman. He is an experienced coal washer and when asked how long

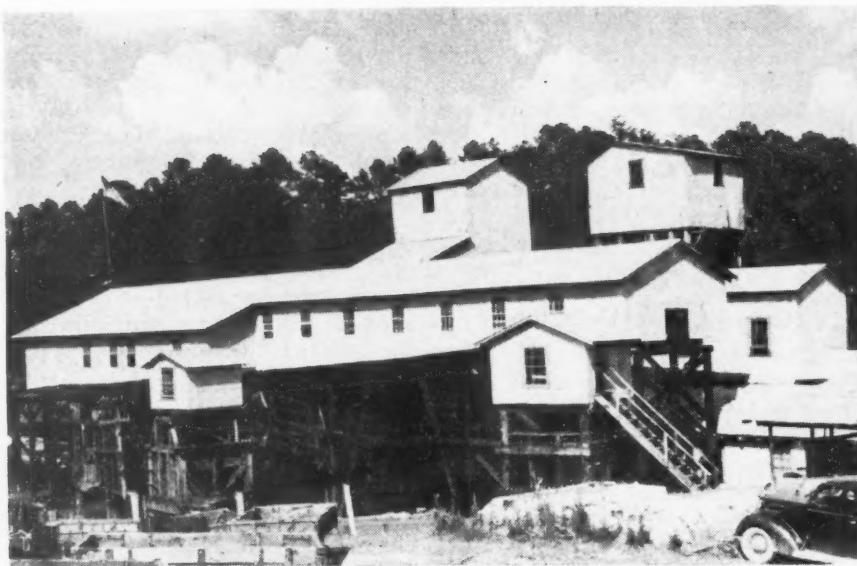


Showing pivot jack and bellcrank transmitting power to the face conveyor extending off to the left at an angle of 90 deg.

width, is 20 ft. and the chain pillars are the same. Breakthroughs, in which the room-shaker drives are placed, have the bottom lifted for a width of 9 ft. The width of coal taken in headings is sufficient to provide gobbing space for the rock.

The heading is driven by hand loading into cars and is developed 200 to 250 ft. ahead of the aircourse, ventila-

tion is provided by blower and tubing. The aircourse is driven by a shaker conveyor with its drive on the main pan line and a bellcrank section delivering at 90 deg. through the breakthrough to cars on the heading. Fourteen 10-ft. pans constitute the usual maximum installed ahead of the drive before the latter is advanced to a new set-up.



The preparation plant was improved by adding six washing tables, a vibrating screen, a third loading boom and several conveyors and elevators.

he expects the rubber decks to last, replied: "I know of some that lasted 13 years."

A 30-ton bin was built for storage of the raw $\frac{7}{8}$ 0-in. From there, it goes by belt conveyor to a Deister motor-driven distributor high above the center of the table room. From the distributor, the coal, after being flushed with water, flows through 4-in. pipes to the tables. Mr. Shamblin finds that the uniform and reliable performance of this distributor is an outstanding factor in uniform performance of the tables. The upper hopper of the distributor which

receives the dry coal and water rotates slowly. Four 4-in. spouts in its bottom, and rotating with it, discharge into a circular hopper partitioned into six equal compartments, one of which feeds to each of the pipes going to the tables. Each of the four spouts of the rotating hopper discharges in sequence to all of the lower hopper compartments. Even if one or two of the spouts should become clogged that would not affect the distribution to the tables.

Adjacent to the original sludge tank a smaller concrete tank, also at ground

level, has been installed to receive the washed $\frac{7}{8}$ 0-in. and table water. An elevator with perforated buckets collects this coal from the tank and carries it up to a loading bin. Water from this new tank overflows into the original sludge tank, which has a sludge conveyor. The washed $4 \times \frac{7}{8}$ -in. coal from the jig is deposited into one end of this original sludge tank prior to being elevated by perforated buckets to a new sizing screen of the mechanically vibrated type.

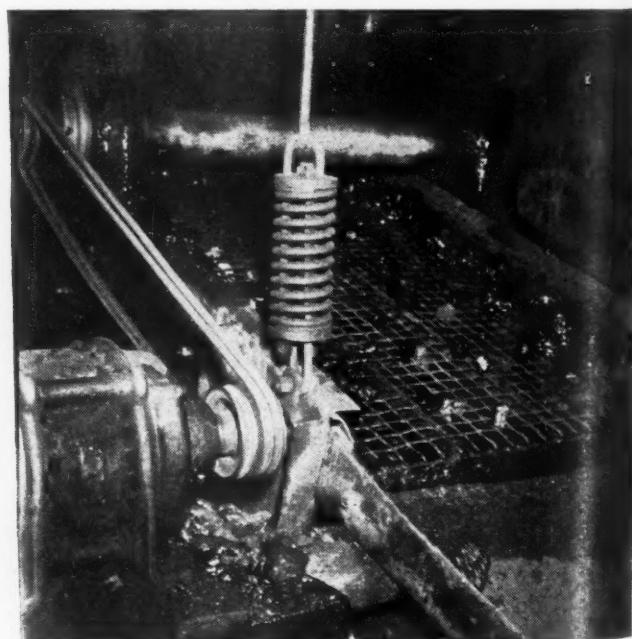
Four Roads Serve Mine

This screen is a double-deck Allis-Chalmers unit and makes a three-way separation: $4 \times 1\frac{1}{2}$ -in., $1\frac{1}{2} \times \frac{7}{8}$ -in. and $\frac{7}{8}$ 0-in. The last mentioned size, which is in but small quantity, consists of degradation and some coal which comes over from the $\frac{7}{8}$ 0-in. tank. A crusher at the end of the egg-loading boom provides for crushing the plus 4-in. for remixing with the washed coal.

Shipping tracks serving the mine connect at West Blocton with four railroads: Mobile & Ohio, Southern, Louisville & Nashville and Alabama Great Southern. Officials of the mine are David Pickett, superintendent; Herman Shamblin, assistant superintendent acting as general outside foreman; John Samsal, mine foreman; and John Lawley, chief electrician. Executives of the company, with headquarters in Birmingham, are: C. S. Bissell, president; C. S. Blair, vice president and general manager; J. I. Combs, chief engineer; and I. W. Miller, general superintendent.



Looking down into the lower, or stationary, hopper of the feed distributor serving the six washing tables. The upper hopper and spouts rotate.



This double-deck vibrating screen was added to make a three-way separation of the washed $4 \times \frac{7}{8}$ -in. coal plus some $\frac{7}{8}$ 0-in. from degradation and from normal overflow from the tabled coal.

SEWER TILE

War Substitute in Discharge Lines

Sections of Tile 9 Ft. Long Made up Outside to Reduce to One-Third Joints Required Underground—Tile Advantages Are Quick Delivery, Low Cost, Acid Resistance and Less-Rapid Clogging

Construction view along the 1,600-ft. run. Charley Perry, general mine foreman, explains that the next step will be to pack fine material under and around the 6-in. tile and then heap 6 in. of material over the top.



CAUGHT last winter by an unusual influx of mine water and an acidity increase which quickly ate holes in the steel pipe, things looked bad for Puritan mine of the Puritan Mines Corp., working the Thacker seam at Puritan Mines, Mingo County, W. Va. Renewal with the same type or with

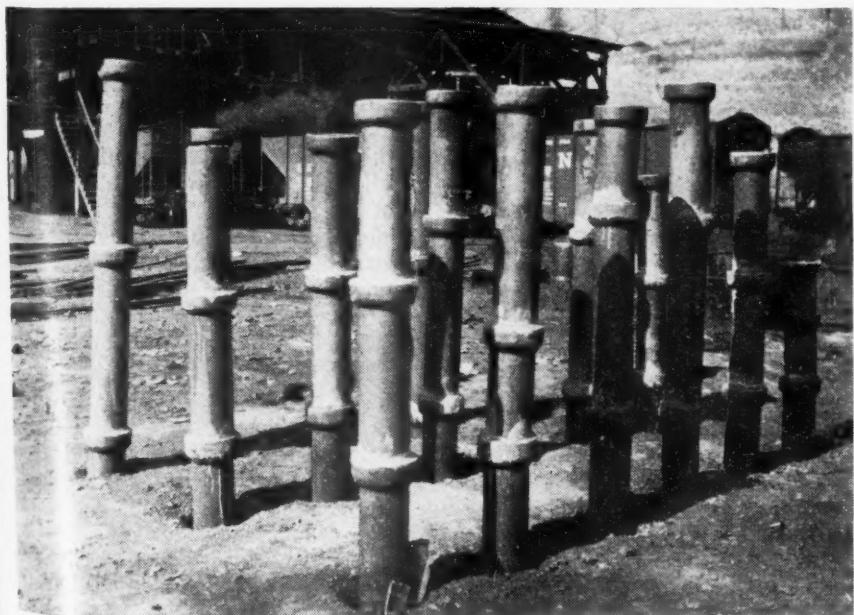
other possible types posed difficult problems not only from the standpoint of expense but also securing delivery. Substitution of salt-glazed sewer tile was the answer to the desired quick delivery, resistance to acid and low cost. Its installation was simplified, speeded and held to a low-cost figure

by cementing two-thirds of all the joints on the outside of the mine, utilizing the tipple crew labor during times when out of coal.

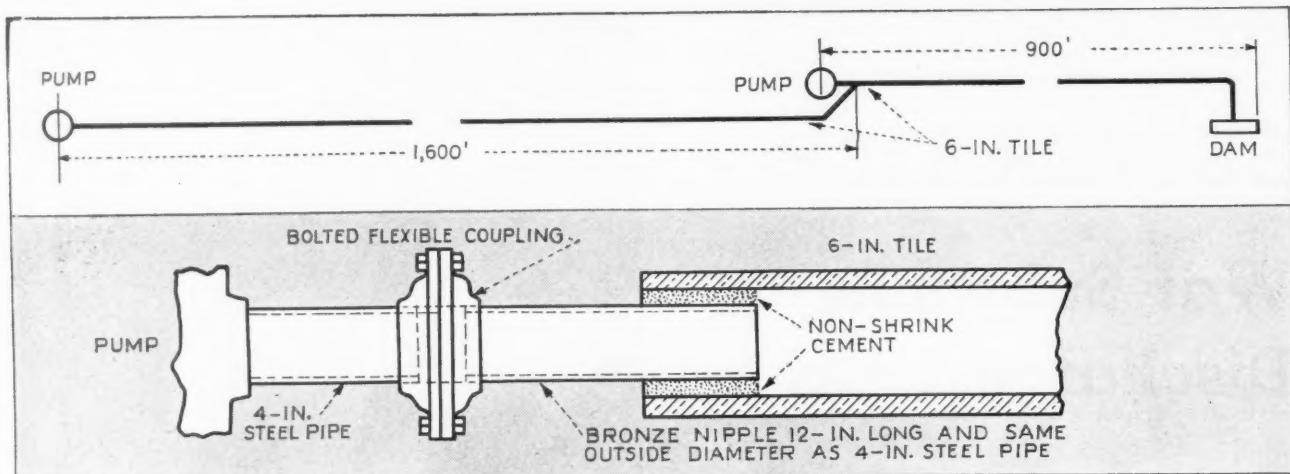
On the trip into the mine with Charley Perry, general mine foreman, to see the glazed tile job, the smoothness of the track was a reminder that the rails on the main line are Thermit-welded and that very likely the success and speed which attended that installation formed a pattern for the tile job. Rails in groups of three were welded on the outside to form lengths of 90 ft. thus leaving but one-third of the welds to be made underground (Coal Age, September, 1940, p. 59). The track, 7,000 ft., installed in 1939 on chromated-zinc-chloride-treated ties, has been a boon to the mine. In spite of soft bottom and a bad water condition that makes road-bed maintenance difficult, only three of the welded joints, according to Frank C. Carothers, vice president and general manager, have broken.

Right Material Found

Three joints of the 6-in. glazed tile cemented together make a length of 9 ft., convenient for transporting in mine cars (10 ft. 2 in. long inside). Near the tipple, where the preliminary cementing is done, the



Three-joint lengths of tile line made up by the tipple crew at idle times.



ABOVE—showing where the corroded steel pipe in two pump-discharge lines totalling 2,500 ft. has been replaced by sewer tile in an air course. BELOW—connection from pump to sewer tile.

method employed to hold the first joint in a vertical position is to dig an 8-in. hole in the ground 12 in. deep. The groups of 20 or more cemented 9-ft. lengths standing there curing give the impression of a series of ventilating pipes from some mysterious underground chamber.

First attempts to make the joints with portland cement failed due to the slight shrinkage when the cement dried. This and perhaps other factors prevented the cement from adhering to the glazed surfaces on the inside of the bell and on the outside of the spigot. That lead to a search for a cement which would not shrink. Instead, however, a special non-shrink aggregate was found for mixing with ordinary cement. This material, "Embeco" brand, Master Builders Supply Co., Cleveland, costing in the neighborhood of 10c. per pound, is used to make a concrete of the following proportions by weight: non-shrink aggregate, 4 lb.; high-test portland cement, $9\frac{1}{2}$ lb.; sand, 20 lb.

Directions for general use of the aggregate do not call for high-test cement but that grade was used to insure getting the quickest and best possible job. The joints thus cemented stay perfectly tight, indicating that perhaps the aggregate helps the cement to cling to the glaze of the tile. Joints do not come loose in handling but a tile in a few of the 9-ft. lengths has broken. The bell of the tile breaks if one end of a 9-ft. length is dropped but an inch or so, or is bumped.

This 6-in. tile cost 17½c. per foot delivered to the property and the total cost installed in the mine is estimated at 40c. per foot. Besides the underground cementing of one-third of the joints, there is the work of properly bedding the pipe to prevent weight strain when it is full of water and the

work of covering it to afford protection against falls of small pieces of slate from the roof.

Where the bottom is of loose or soft material a trench is shoveled out 4 to 6 in. deep. After the pipe has been lined up with slabs or blocks of slate and the joints cemented, fine material is carefully packed underneath and around the sides. Finally small-sized waste material is placed over the pipe to give it a cover of 6 in. or more. A line of posts on 6-ft. centers is set to prevent the fall of large pieces of roof onto the pipe. At first, the posts were placed all on one side of the pipe. Now they are being staggered, one alternately on each side.

Clogging Is a Problem

At the time of making the illustrations and writing this article, water was being pumped through a 930-ft. length of the 6-in. sewer tile to a dam inside the mine. From the level of the pool back of this dam, which is but 3 ft. high, the water flows through old workings to the outcrop. That 930-ft. run displaced two 4-in. steel pipes that had been operated in parallel. Another 1,600-ft. length is displacing one 4-in. pipe. It will carry the discharge from a second pump to the inby end of the 930-ft. run. Total static head from this second pump to the dam is but 18 ft. The practical limit of pressure at which the tile could be worked is not known but a manufacturer ventured the figure of 12 lb. per square inch.

Clogging of 4-in. steel lines has been a problem at the mine. If a pipe was not eaten up in six months, then it was likely to become plugged to the point where it was useless. Indications are that the sewer tile lines will not be thus affected.

Connection from pump discharge

to tile is made by a bronze nipple 12 in. long and of the same outside diameter as a 4-in. steel pipe. This bronze nipple is cemented inside a spigot-ended tile and then fastened to a 4-in. steel pipe by a Dresser coupling. That affords a degree of flexibility and permits ready renewal of the steel-pipe connections to the pump casing. The two pumps now in use in this section of the mine and discharging through the sewer-tile line are LaLabour No. 15 self-priming centrifugals, 150 g.p.m., driven by 5- and $7\frac{1}{2}$ -hp. motors.

Until the winter of 1942-43, the acidity of the water was such that an ordinary cast-iron pump was eaten up in a year of service. It is conjectured that the mined-out Winifrede seam above the Thacker workings is responsible for the high corrosiveness of the water inflow that winter. Cast-iron pumps failed suddenly and it was found that a new cast-iron impeller would last only 10 days. The best bronze impellers that could be secured lasted but two or three weeks. New LaLabour pumps of a special steel alloy, however, have shown no appreciable corrosion after several months' service.

Tile is already on hand at the mine for an additional 1,400 ft. of 6-in. line to be laid soon in an entry being driven to the outside on Pigeon Creek and for a shorter 4-in. line to carry water over a local hump into a drainage ditch.

Seam thickness in the Puritan mine ranges from 36 to 48 in. The low areas, together with difficult top and bottom conditions, have prevented the adoption of mobile loaders and self-loading conveyors. At present, the mine produces 865 tons per day, 75 percent hand loaded onto shaker conveyors and 25 percent hand loaded into mine cars. The tipple operates one shift.

GANGWAY WORK

Speeded by Loader With Heavy Savings

Cost of Mucking Machine for Gangway Driving Saved in First 3,000 Ft. at McKay Mine—Average Advance Is 8 Ft. a Shift With Three Men Against 6 Ft. and Four Men in Hand Loading

SEVERAL TIMES ITS COST has been saved by using a compressed-air-driven mucking machine to speed gangway work at the McKay mine of the Dale Coal Co., Ravensdale, Wash. Installed Dec. 15, 1940, the mucker returned the purchase price in approximately the first 3,000 ft. or so, and up to Oct. 1, 1943, had driven some 6,800 ft. of gangway in 850 working shifts.

Operating in King County some 30 miles southeast of Seattle, McKay mine recovers the McKay seam, a bituminous vein dipping 40 to 70 deg. W. The seam is made up of two benches separated by $2\frac{1}{2}$ ft. or so of bone and carbonaceous shale. The upper bench is usually 3 to 4 ft. in thickness and the lower $4\frac{1}{2}$ to $5\frac{1}{2}$ ft., averaging 60 in. Mining normally is done in the lower bench. Between this bench and the sandstone floor a few inches of bone coal or shale often is present.

The mine is served by two slopes driven in rock, and the coal is worked generally down the pitch from water-level gangways turned off the slope at intervals of 370 ft. measured on the 30 deg. rock slope. Each gangway is paralleled by a counter 30 ft. up the pitch. This counter is driven by slusher scraper. The coal between gangways, or drifts, is mined by the chute-and-pillar system, with the chutes driven directly up the pitch on 50-ft. centers.

Chutes and pillars are worked on a one- or two-shift basis; gangways, three shifts. The coal is prepared by hand-picking the $3\frac{1}{4}$ -in. lump and washing the remainder in a 2-cell Elmore jig. After washing the coal is sized on Leahy vibrating screens to make the following: $3\frac{1}{4} \times 1\frac{1}{8}$ -in. egg, $1\frac{1}{8} \times \frac{1}{8}$ -in. nut and $\frac{1}{8} \times 0$ -in. screenings. Equipment is available for making combinations as desired. In addition to railroad loadings, the mine serves a large truck trade. The operating staff is headed by R. D. Scott, supt.

A representative gangway, or drift,

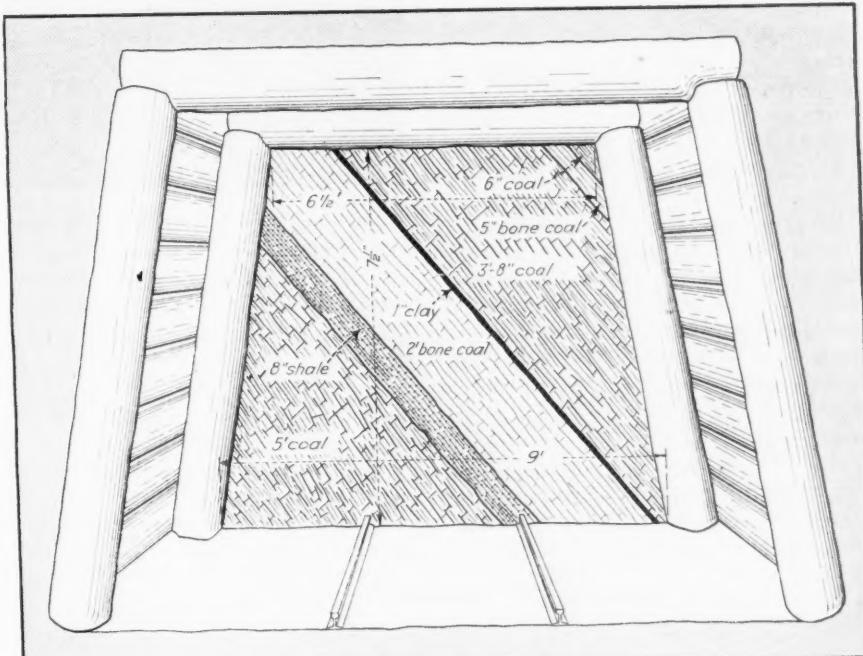


Fig. 1—Representative drift section at McKay mine.



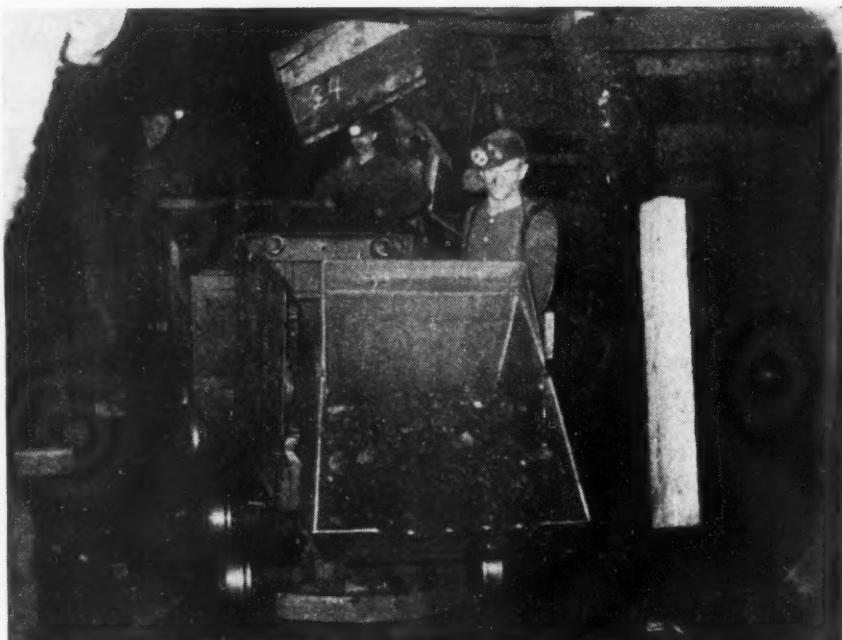
Loading shot holes in a typical gangway face. Three-piece timber sets lagged on the top and sides are kept up to the face at all times.

section is shown in Fig. 1. Height under the headers is 7½ ft. Width inside the timbers is 9 ft. at the bottom and 6½ ft. at the top. Heavy timbering is required to keep gangways open because of the nature of the coal and the surrounding strata. Legs and collars of the three-piece sets consist of 14- to 16-in. fir. Timbering is kept right up to the face, with the sets on 8-ft. centers. The sets are lagged over the top and on both sides with 3-in. thick random-width fir, thus completely inclosing the gangway.

Mucking in driving is performed by a compressed-air-driven Gardner-Denver GD-9 mine-car loader. With this loader, the dipper rolls up and back to discharge the coal into the car, the machine in effect "throwing the coal over its shoulder." Capacity of the dipper is 160 lb. of coal. Two 5-cylinder air motors power the various dipper and machine movements. Rated air pressure is 80 lb. per square inch; rated consumption is 150 cu. ft. per minute.

Gangways are advanced in rounds averaging 8 ft. in depth at McKay mine. Track gage is 36 in. and the wood mine cars have a capacity of 50 cu. ft., or 1.07 tons of prepared coal. Car height is 46 in. over the rail. Length inside is 6 ft. 8 in.; width inside, 40 in. One round makes approximately 30 cars or slightly over 30 tons of mine-run coal. Average loading time for a round is two hours, including car changing by hand trammimg from the passing track. The gangway is the intake and consequently the work is in fresh air.

Switching points for changing cars are not over 400 ft. from the face, and



Mucking machine in operation. This view shows the dipper and back of the machine a chute opening.

on this basis the average over-all time per car is 4 minutes, including changing. Actual loading time is 1 to 1½ minutes per car. To date, the best mucking time has been 19 cars per hour, compared with the average of 30 cars per round in two hours.

Including timber setting, track advancement and other work, the average gangway advance under normal conditions was 8 ft., or one round per shift. A face crew, handling drilling, shooting and mucking, now comprises three men, with two additional men on timbering. Before installation of

the mucking machine, the face crew was four men, aside from timbermen and others, and the average advance was 6 ft. per shift, compared with 8 ft. with the mucking machine.

The mucking machine normally stays in the one gangway, although it could take care of as many as three places if they were close together. But even with only one working place, the reduction in mucking time and use of a smaller crew have resulted in savings sufficient to return the cost several times since it was placed in service three years ago.



Dipper discharging its load to a mine car. Cars hold 1.07 tons of prepared coal and the usual loading time is 1 to 1½ minutes per car.



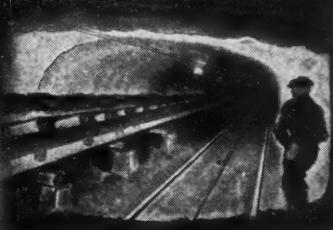
R. D. Scott, superintendent, pauses for a snap on the parting.

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COAL AGE



THE FOREMEN'S FORUM

How Rock Dust Can Be Made Effective

To Subdue Explosions, Associate Rock Dust and Coal Dust Intimately and Free Dust of Undersize—Mixing Most Essential With Mildest Explosions

STILL NOT SATISFIED with the rock dusts now being used in the coal mines to suppress mine explosions, the British Safety in Mines Research Board under its Acting Director, Dr. H. F. Coward, successor of Dr. R. V. Wheeler, deceased, is making further researches and observations into their behavior and trying to discover how their action may be improved.

[It must be remembered that, as a whole, the British mines are warmer and drier than ours, depth with its attendant heat not only causing the evaporation of the moisture but also reducing the inflow of water. However, extremes often are the best guides to direct those of us whose difficulties are less onerous, and much may be learned from British experience.]

Imperfect Mixing of Rock Dust and Coal—After an explosion, declares the Sir Malcolm Delevigne, the chairman, in the

being spread by hand systematically twice each week, and investigation showed an excellent admixture from layer to layer and both along, and across, the road.

More Drastic Requirements—So far only 65 percent of incombustible dust is required, but regulations which were framed (that would doubtless have come into force, had not the war supervened) required 75 percent of such dust for four of the five mines which had experienced major explosions in the last 20 years.

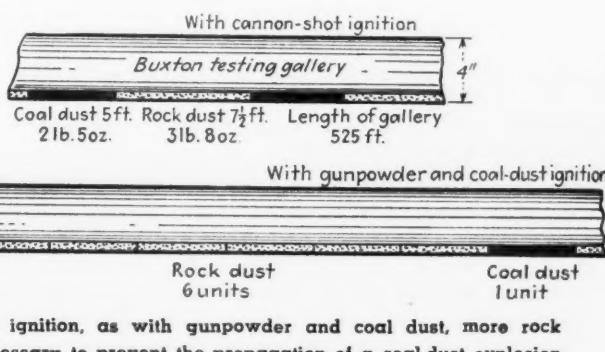
Weak Explosion Indicates Need for Effective Mixing—Experiments described in the 1941 report developed the ill effects of a more imperfect mixing than is likely to occur in actual mining practice, showing that when rock dust and coal dust were spread in alternate lengths of the 4-ft. diameter gallery at Buxton, nearly twice as much rock dust was needed to prevent an

when the dusts were laid in alternate strips as had been required when the dusts were well mixed. The figure was even higher (sixfold) when lesser quantities of dust were used, but it was less (twofold) with thicker deposits.

Is Dust in Air Same as Dust on Floor?—Sampling by strip samples 3 in. wide at 1-*yd.* intervals and taken first to a depth of $\frac{1}{8}$ in., then again to another depth of $\frac{1}{8}$ in., then to $\frac{1}{4}$ in. and finally to $\frac{1}{2}$ in., it was found that almost all the samples contained 68 to 70 percent of shale and flue dust. Sampling the dust in the air 6 in. and 18 in. above the floor, immediately after mine workers had passed, 71 percent of the suspended solids was found to be incombustible dust. Repeating the test on another occasion gave 70 percent of incombustible dust on the floor and 70 to 71 in the disturbed dust, showing that the dust in the air in these instances was quite similar in composition to that on the floor.

An air blast of 5,000 ft. per minute from a $\frac{1}{2}$ -in. flexible hose directed tangentially to the dust on the floor raised clouds of dust which were within 1 percent of the same composition as the road dust and remained so when carried as far as 480 ft. from the source of the disturbance, and the same was true with a blast of 2,000 ft. per minute which is just enough to lift coal dust from a flat surface. However, the incombustible dust used was of a type that dispersed easily, and the same results might not be obtained with a dust of a different sort, so a test with limestone dust will be made. In the time between the raising of the dust and the arrival of the flame of an explosion, the separation seems likely to be small; thus, as far as the tests reveal, it seems probable that the composition of the air mixture and the floor mixture always will be almost identical.

Overfine Dusts Act as if Too Coarse—Where there are extremely fine particles in rock dust, they are disposed either to build up on one another (to agglomerate) or to adhere to larger particles making them oversize. It has been found also that when the finest of particles are removed, the dusts are more easily disturbed by a tangential current of air. Some tests are to be made with the dust cleansed of the finest



With slow ignition, as with gunpowder and coal dust, more rock dust is necessary to prevent the propagation of a coal-dust explosion

1st annual report of the Board, white patches of undisturbed limestone dust were found in the path of the explosion, and, in a more recent instance, an explosion of firedamp was extended by coal dust drawn into the roadway from accumulations in abandoned "walls" ("long-wall faces," presumably) and "stentons" (passageways between two separate mine workings) where it had accumulated but, as the main roads contained enough rock dust to suppress the explosion, it was stifled just outby that region. [This exhibits the danger of leaving fine dust in abandoned mine workings]. In one traveling way, incombustible dust is

explosion from being propagated than had been necessary when the dusts were well mixed. The ignition was caused in those experiments by a cannon shot of gunpowder, which produced a marked concussion, and it seemed that a less violent source of ignition might make an even greater quantity of rock dust necessary, because coal dust is more easily raised than rock dust, and the lighter blast might raise more of the former than of the latter. Using a mortar charged with gunpowder and coal dust and so obtaining a large flame with little violence, about four times as much rock dust was required to prevent propagation

of its particles by a Holmes Jaffhor Rotor Dust Extractor. A shale dust with 18 percent of its particles by weight of smaller diameter than 10 microns (0.0004 in.) required a minimum speed of air current of 3,200 ft. per minute to move it from a smoothed surface, and about 16 percent of

the dust blown into air in standardized apparatus was still suspended after 2 sec.

Successive passages through the separator, suitably adjusted, reduced the content of excessively fine particles and improved the dispersibility of the dust, so that after three passages, only 4 percent of the parti-

cles had diameters of less than 10 microns, and an air current of only 1,800 ft. per min. sufficed to move the dust from a smoothed surface, and 33 percent remained in suspension after 2 sec. Similar improvements were effected with magnesian limestones and gypsum dusts.

Tonnage With Safety From Thin Seam*

By SAMUEL LAW

Assistant Chief Engineer
Red Lands Coal Co.
Hellwood, Pa.

IN THE MINES of the Red Lands Coal Co., crossbars cannot be set, in many places, though the shuttle cars are of only three tons capacity. In other places, cross-bars have to be of minimum thickness. The coal ranges in height from 36 to 46 in. with an average approximating 41 in. Car drivers more often than not must sit in a stooped or cramped position and, therefore, can seldom drive at normal speed. Gradients may range from 2 to 15 percent against the load. In headings, top or bottom must be taken to provide height, which of these is chosen often being a factor in controlling length of shuttle-car haul.

KEEP DOWN SHUTTLE TRAVEL—Projected plans should be such as to limit shuttle-car travel and all crosscuts should be angled so as to facilitate passage from road to road. Where possible, alternate runways should be provided. Separate crews working off-shift used to take rock in the section where its removal was most needed, but now it is taken on-shift by the crew that loads the coal. Short hauls with resultant higher average production have justified the change.

SHORT ROADS ARE USUALLY GOOD ROADS—Normal car-operating speed is little more than 3 miles per hour, and the average time needed to change and load a car is about 4 min. From these data, it is determined that 500 ft. is the maximum haul. With that as maximum, runways can be kept in better condition than with a longer haul and, if bad spots develop, they, being less frequent, can, and will, be repaired more rapidly. With excessively long hauls a man may be required to keep runways in a fairly passable condition.

RUN BATTERIES ALL DAY—Long hauls overtax battery capacity. When batteries must be changed during the shift not only is time lost but a vicious cycle of battery changes from shift to shift is set up, and the entire battery service may fail from continued misuse. Long runways soon become a series of potholes, and the driver has to slow down to eliminate jolts. The intermittent use of power that results tends to burn contactor points and cause electrical failures, while strains on frames and driving mechanisms eventually cause fail-

ures of mechanical parts. Long hauls also fatigue drivers, as the handling of the car is more difficult, jolts and strains are more frequent and travel more continuous than with short hauls.

ONE CAR ON SHORT HAUL BEATS TWO—In a set-up with a 1,000-ft. haul from face to elevating conveyor, the shuttle-car drivers tried their best and traveled 64,000 ft. during the shift complaining of fatigue at the shift's end. The loading machine wasted time waiting for two shuttle cars, which themselves lost no time except to change batteries on shift. About 500 ft. of the runway was rough. In another set-up, a single shuttle car was hauling coal an average distance of 400 ft., over a runway without a single pothole or rut. This man was subjected to none of the strain of the other two drivers, yet he hauled 50 tons per shift more than they.

KEEPING CARS IN CONDITION—A spare car is a distinct asset in keeping all shuttle cars in condition. When electrical and mechanical failures become too frequent, the spare car can be substituted for the one that has to be overhauled. Careless rounding of corners may break battery cells and destroy tire sidewalls. Goosing the controls too often breaks drive chains and speed reducers. This trouble has been partly eliminated by providing separate controls for each direction of travel. Daily oiling increases chain life. Every driver should know how to treat small car ailments such as burned or broken contact fingers or broken drive chains. Such repairs often can be made in less time than will suffice to inform the mechanic that help is needed.

PROTECT TIRES—Though tires are heavy enough for a comparative service of thousands of miles, most of them last only 1,000 or 2,000 miles. Sidewalls take a beating from coal ribs when the roads are in poor condition, and a steel disk has been planned to cover the sidewalls of the tires of the rear wheels. After a disk on one wheel had not been removed for 6 months, and the car had traveled 1,500 miles, the tire showed hardly a blemish, yet tires had to be changed three times on the opposite wheel during this same period.

KEEP UP BATTERIES—Quite often the batteries were changed without turning off the charger. As a result, the plug contact points were burned so badly that they would not charge the battery. When batteries were plugged into the car, they were insecurely connected, causing their contact points to char, cutting off flow of power to the controls. Batteries were overcharged, and others were undercharged because

someone neglected, or did not know, how to set the charger properly. The lids were not raised while the batteries were being charged, thus the latter were not ventilated. For this reason the acid bubbled excessively. Acid and dirt were not cleaned from battery tops, permitting corrosion.

ONE MAN TAKES CARE OF BATTERIES—A full-time battery man now is in charge of inspection and repair of batteries, watering them when needed and cleaning them once a week.

INJURIES TO CABLES—Shuttle cars running over the several cables used in mobile loading may cause accidents and possibly mine fires. When such a car runs over a cable, the wires inside the rubber covering tend to roll over each other, eventually breaking down the inside insulation, causing a short circuit, which blows out through the rubber coating. Cables have blown out, while being handled, severely burning the person handling them, usually their hands or eyes. To run over cables is a short-sighted practice, for then they are prematurely worn out especially when, as now, they are practically irreplaceable.

HANGING CABLES OR BURYING THEM—Obviously such cables must be crossed or coal cannot be loaded. Where height permits, cables are carried overhead across the runways but where necessary they are trenched into the floor. A way of carrying them overhead is to fasten them to the side of permanent crossbars by inserting wedges on top of the crossbar and laying the cable on the wedges. Setting posts under the ends of a 1-in. plank and tying the cables to the plank affords a speedy but temporary arrangement which, however, is likely to be neglected unless the bosses are on their toes. Another system is to plug wires into the roof about 5 ft. apart and tie the cables with them or to drive a double $\frac{1}{2}$ in. hook into plugs in the roof and place the cables on them, such holes being quickly drilled with short jumper drills.

Correction of Article On Pump and Motor

In the article in this department, November, 1943, entitled "What Pump and Motor Will Be Needed Here?" the amperage was calculated for a single-phase motor which in that size, of course, is impractical. For a three-phase motor, the type that would normally be used, the current would be smaller in the ratio of $1:\sqrt{3}$ or 1:1.73 or 221 amp.

*Abstract from article entitled "Safe and Efficient Shuttle Car Operation" presented Dec. 10, 1943, at meeting of Coal Mining Institute of America, Pittsburgh, Pa.

Reconversion and Contract Termination

AMERICAN industry is dedicated to an all-out effort to achieve victory, and its good faith in this direction is amply demonstrated by the results.

American industry also is dedicated to making democracy work effectively after the victory. And it is toward this objective that industry must prepare itself to guide the processes of demobilization and reconversion in order to minimize the dislocations and chaos which too easily can result from so tremendous a task.

We exercised foresight from the very beginning of the war mobilization program. Let us now exercise foresight in the approaching changeover from a wartime to a peacetime economy.

The first step in converting American industry from military to civilian production is the termination of contracts between the government procurement agencies and the producers. There are now in force war contracts amounting to tens upon tens of billions of dollars. As the demand for weapons of war decreases, the Armed Services will undertake to cancel contracts. With the emphasis shifting from weapons of one category to weapons of another category, many billion dollars worth of contracts already have been terminated. It is hoped that the experience now being gained in this work will provide the basis for ef-

fective and sound procedures when an avalanche of cancellations comes later.

Many complex problems involved in the termination of contracts will materially influence the success of the entire reconversion program. Once war demands fall off sufficiently to permit the renewal of civilian production, we will have to act with great speed if we are to avoid large-scale unemployment. Prompt financial settlements of contracts and the rapid clearance of plants are of immediate and great significance. In many cases the removal of equipment and raw materials will be more important than money payments. The allocation of raw material for civilian production will be of paramount importance.

Government agencies obviously must exercise great care in spending the people's money and in protecting the interest of the public against excessive payments. Unjust enrichment at the expense of the people will not be condoned nor will it reflect favorably upon management to present inflated claims. But long-delayed negotiations, which will retard the initiation of civilian production, likewise must be avoided.

The contracting agencies and the manufacturers both know that the greatest losses in the reconversion period will result from delays in getting peacetime production under way. The

greatest potential wastes lie in unemployment and in idle plants. The magnitude of such losses to the public can be far greater than the money spent in liberal settlements; to the manufacturer, these losses can represent vastly more than the extra funds that might result from interminable litigation. Policies must be firmly established now whereby the manufacturers, including subcontractors and suppliers, will receive substantial settlements immediately in order that ample funds be available for reconverting plants and accumulating necessary inventories of peacetime goods. Nor must we overlook the fact that the uncertainty of long drawn-out disputes will have a stifling effect on enterprise and that final settlements, therefore, should be made as promptly as possible.

Plants that are equipped largely with special wartime tools and machines and that are fully stocked with materials, components, and finished military products will not be able to undertake any substantial degree of conversion until this machinery and this inventory are removed. Advance arrangements are essential for the prompt clearance of great numbers of plants the country over. Adequate warehousing facilities must readily be available so that the changeover to civilian production will not be hampered.

As war demands decline, civilian output will be resumed; and while we recognize that the demands for munitions must vary as the strategy of the military leaders is changed, it is hoped that the Armed Services already have or soon will develop schedules of their continued needs

under different strategic assumptions. If we know in advance the probable curtailment in war requirements we are in position to estimate the timing and the quantities of raw materials, the number of workers, and the industrial facilities which will be available for peacetime purposes. It will then be possible to integrate the lifting of restrictions on civilian production with the drop in war production.

Needless unemployment and idle plants will prevail if restrictions on the output of civilian goods are removed at a slower rate than available manpower, materials and plants permit. On the other hand, if the controls on civilian production are removed prematurely or too freely, then the production of military requirements will be hampered correspondingly. There will be great clamor and pressure for eliminating all restrictions as soon as any measurable quantity of materials and numbers of workers are freed from war work. It will react adversely on industry as well as on government if these pressures are heeded indiscriminately, thereby retarding the production of munitions for our boys who still will be fighting and dying at the front. The coordination of declining war demands with increasing civilian production probably is the most difficult and at the same time the most important task in our entire reconversion problem. Advance planning and sound judgment are essential.

An order of priority for initiating non-war or civilian production must be prepared beforehand. The schedule of resumption of peacetime production should be governed by the amounts of

materials, manpower and facilities that are available as well as by the relative needs or importance of different products. There will be strong competition for priority among the various kinds of consumer goods, equipment needed for reconversion, producers goods required for expansion and modernization, and export demands. Relative need obviously is the most compelling criterion. But because of the importance of expediting reconversion, earliest consideration is urged for the tools and fixtures and models which will expedite large-scale civilian production when adequate labor and materials are available. In any case, advance schedules will be needed to avoid makeshift, piecemeal lifting of controls on the basis of who shouts the loudest.

Another difficult problem of the reconversion period will be to keep to a minimum the distortion of inter-industrial and intra-industrial relationships. Many varieties of consumers goods compete for the consumer dollar, and some industries will offer strong resistance if the green light is given first to industries whose products may thereby acquire a time advantage.

Even more difficult will be the matter of competition between companies producing the same products. Some manufacturers may find themselves tied up with continuing war contracts with restrictions on their peacetime products suddenly lifted and their competitors free to take advantage of the situation. The declining need for different kinds of war materiel will vary greatly, and some producers inevitably will be available for peacetime production considerably

in advance of some of their competitors.

This raises the question of victory models or nucleus plants to eliminate competitive advantages among producers of identical products pending the time when all are on an equal footing again. Policies controlling this should take into account the degree or the extent of competitive advantage which reconversion might bring, and also upon the time interval during which these advantages will prevail. Such programs necessarily mean increased government control, hence they should be adopted only under the most pressing circumstances.

There is the important question of termination as between large and small plants. Fairness must be exercised, and undue advantage to either group must be avoided in extending opportunities to continue receiving profitable war orders or in getting back into civilian production. The problems of small manufacturers must not be neglected in this period. Likewise, any restraints on new ventures and on more vigorous competition must meticulously be avoided.

There also is the question of communities which have been greatly enlarged and others which actually have been brought into being by the war. It might be advisable to terminate contracts in these areas first in order that the workers might be encouraged to migrate elsewhere while employment prospects are most favorable. Also, if continued production of some armaments is contemplated after the war, it might be well to concentrate this production in communities which otherwise would be stranded.

If the process of terminating contracts is to be geared into meeting continued demands for munitions and also expediting reconversion, then the Armed Services must accept broad policy considerations as criteria for cancelling contracts. Procurement officers might be inclined to cancel contracts with all high cost producers first. Or they might be inclined to cancel small producers first so as to reduce the administrative burden. Then again, they might cancel the newer producers of specific products rather than the older, time-tried manufacturers.

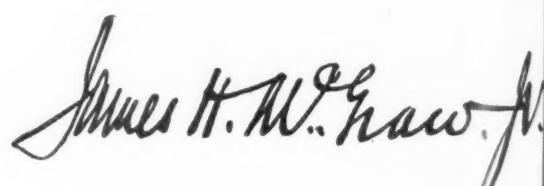
These procurement criteria may all be highly desirable and efficient but other important considerations such as those mentioned above must be given proper attention. ***Demobilization cannot be a separate process from reconversion.*** They must be united. The termination of contracts is a demobilization task, but I am confident that the procurement agencies appreciate the importance of this operation in facilitating reconversion and that they will take full cognizance of the policies necessary for giving every assistance to initiating peacetime production.

I have not attempted to raise all the important policy questions in terminating contracts, nor do I propose specific solutions for each major problem. Rather it has been my purpose to indicate the complexities of the task which faces us and to urge that intelligent and sound plans be developed now while there is time. By so doing, we can avoid the dislocations and economic disorder which otherwise might characterize the re-

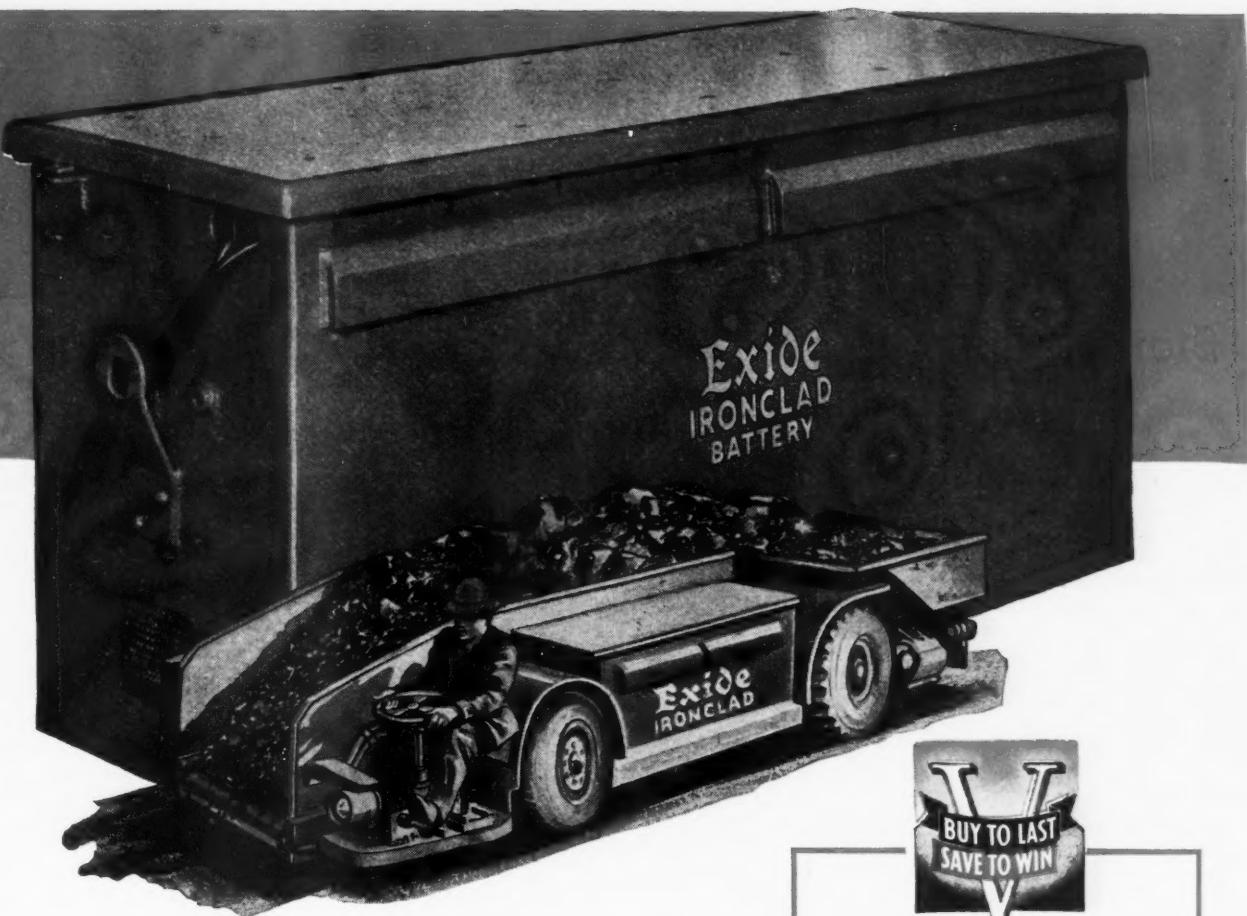
conversion period. The better we are prepared, the more rapid will be the resumption of full employment and good business after the war is won.

This job of changing America's industrial pattern from war to peace speedily and efficiently, is one which will tax the talents and knowledge of the ablest business men of the country. These men can, and I am sure that they will, attack this task with the same energy and determination that characterized their efforts in the period of mobilization for war.

Industry advisory committees were established to cooperate with governmental agencies in the great task of conversion to a full war economy. These committees are the means through which industry has the opportunity to play a major role in the solution of the problems of reconversion. It must assume that responsibility or accept the consequences in the form of enforced government control. Industry must take a renewed interest in these committees and make certain that our best minds and strongest men are available for the challenging job of conversion which we face now. It is a job that must be done well if we are to have a good start on the road to a greater democratic and free enterprise nation.

A handwritten signature in black ink, appearing to read "James H. W. Haw, Jr." The signature is fluid and cursive, with "James" and "Haw" being more prominent.

President, McGraw-Hill Publishing Company, Inc.



The Pulse of Industry ... Exide-Ironclads

The body of American industry and the far-flung arms of commerce and trade are controlled by the pulse beat of American mines. You can almost measure the tempo of production by the steady beat . . . the pulsating . . . the rumbling of speeding underground electric locomotives, shuttlecars and trammers. Therein lies the potential power of industry.

Hand-in-hand with this is the power of Exide-Ironclad Batteries. More Exides are used underground than all other batteries combined. The simple reason is that the power reserve of an Exide-Ironclad is abundant for every demand. Add to that, faithful, uninterrupted service, extreme ruggedness, and long life and you can readily see why Exide is the leader. A plus factor is the ease of maintenance which saves labor, and costs as well. When you buy an Exide you *Buy to Last*. Take care of them and *Save to Win*.

DELIVERIES—Despite wartime conditions, we are quite sure that we can make deliveries to meet your requirements.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32
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MAINTENANCE IS EASY IF YOU FOLLOW THESE RULES:

- 1 Keep adding approved water at regular intervals. Most local water is safe. Ask us if yours is safe.
- 2 Keep the top of the battery and battery container clean and dry at all times. This will assure maximum protection of the inner parts.
- 3 Keep the battery fully charged—but avoid excessive over-charge. A storage battery will last longer when charged at its proper voltage.
- 4 Record water additions, voltage, and gravity readings. Don't trust your memory. Write down a complete record of your battery's life history. Compare readings.

If you wish more detailed information, or have a special battery maintenance problem, don't hesitate to write to Exide. We want you to get the long-life built into every Exide Battery. Ask for booklet Form 1982.





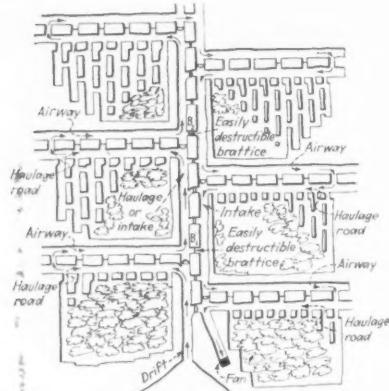
STATE-BOARD QUESTIONS

State of Alabama Mine Foremen[†]

Continuous Current

Q.—How does continuous ventilation decrease efficiency of air current?

A.—(1) With continuous ventilation, all the air has to go to all the workings, on a "sight-seeing trip," so to speak, whereas, with split ventilation, the air goes directly as possible to the place in a certain section or split of the mine where it has work to do and in a measured quantity that will suffice to do it and then goes right out after it has done that work, thus reducing resistance to a minimum. With ten entries and continuous ventilation there are ten long "detours" in each of which the air may go a half mile to advance only about 50 ft. Too many distressing detours waste the automobilist's precious gasoline as too many "detours" in the air current waste the mine operator's power.



With continuous current: Planned for "expendable" stoppings at B_1 and B_2 ; travel, 6,080 ft.

Fig. 1 shows a mine with a continuous current which travels 6,080 ft. in ventilating the entries, and Fig. 2 shows the same mine with split current that travels an average of only 1,960 ft. to do the same work. The continuous air current travels 3½ times as far as the split current—and this is not a fair example, for in most mines the side entries are three times as long as in this illustration.

(2) With continuous ventilation, the air contaminated in one section of the mine is taken to another, where it pollutes that section also, which is not the case with split ventilation.

(3) With continuous ventilation, meth-

ane generated in one section goes to another, where it picks up more methane, and so on, whereas, with split ventilation, it goes right out with its methane and does not follow a long trail through every other section of the mine.

(4) With continuous ventilation, the poisonous atmosphere resulting from an explosion is sure to travel all through those portions of the mines to which the

If, however, with split ventilation, the explosion occurs on the return, or airway, side of the main entry, then the air will pollute the airway from that point out, but it probably will not enter the side entries on that side because the gust of air will not be heavy enough to cause "vacuums" (more correctly "pressure depletions") to occur in such entries as will prepare them for the entry of the polluted atmospheres (see *Coal Age*, September, 1942, p. 65). However, on the restoration of pressure, some polluted air not expelled from the fan may be drawn back into the return airway as far as the mouths of the entry in which the explosion has occurred, filling the air in the main return airway with this polluted air as a backwash, provided the fan is not running. If it is running, the destruction of the overcast will bring fresh air to the main return airway and leave the polluted split isolated.

With the continuous system, it is desirable that crosscuts be driven in extension of the return headings of the side entries on the intake side of the main entry as at B_1 and B_2 . They will always serve the purpose if the air current is to be divided into splits later. If then this crosscut is provided with a stopping that is readily movable, the air may throw over that obstruction and may go on to the return of the main entry and so one advantage of split ventilation may be obtained or even surpassed by continuous ventilation, for now the entire current of air will be concentrated on the entry which has been involved in the explosion, and the passageways through which it travels will be swept entirely clear of poison fumes and gas with no one in other entries in any way jeopardized.

If in continuous ventilation the explosion occurs in the side entry on the intake side of the main entry and it destroys the door as well as the "expendable" stopping, to use a military term, then the fresh air will leave much of the poisonous atmosphere in that side entry and establish a direct course to the fan, thus isolating the side entry, which is not quite so good as if the door were preserved. Expendable stoppings, however, have their disadvantages: they are likely to leak and may be broken down prematurely and thus will short-circuit the air when such short-circuiting is undesirable. With a violent explosion, the force with split ventilation will do as much damage throughout the mine as with continuous ventilation, for some brattices and overcasts will be destroyed, and the air will establish new channels. Even continuous ventilation will fail to do its deadliest when the violence is severe because the ventilation will be

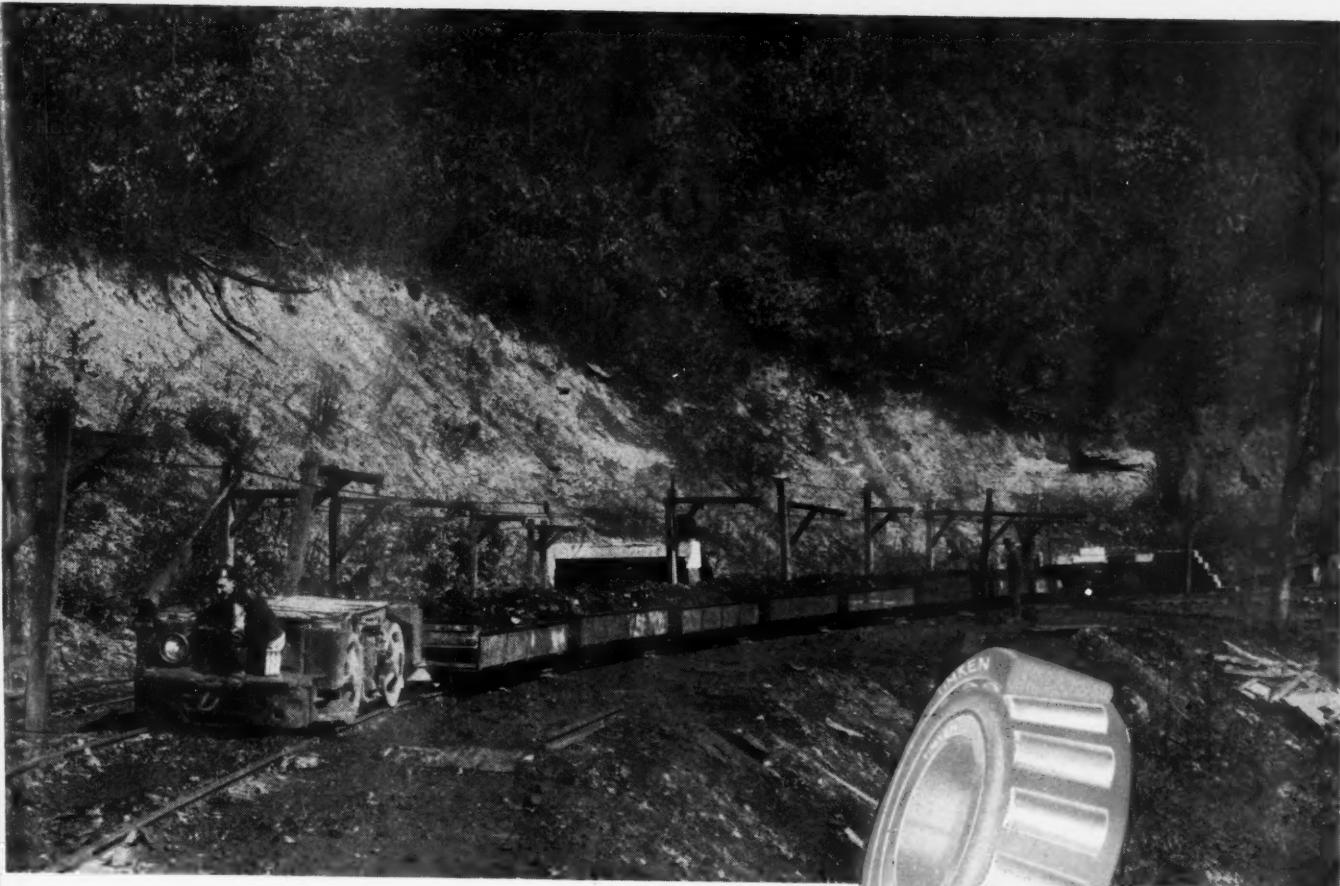
With split current: Only scientific way of handling air: travel, 1,960 ft.

current normally travels—in other words, to the leeward of the ignition—unless, indeed, the violence of the explosion is extremely severe and travels leeward beyond the entry in which it occurs. Then it probably will make such breaches in the brattices and doors which control the air current as will profoundly modify, or wholly destroy, the ventilating system.

However, with a split air current, when the explosion occurs in a side entry on the haulage, or intake, side of the main entry, the poisonous atmosphere may travel out to the return of the main heading at points noted at A_1 , A_2 , A_3 in the plan of the mine having split ventilation. So each of these three entries will be isolated from one another and from the rest.

If the explosion is a little more violent, the overcasts and stoppings may be swept away; and then all ventilation beyond the first outby overcasts or stoppings thus removed will be destroyed just as in continuous ventilation.

[†] Continued from November, 1943 *Coal Age*, p. 89.



ALL COAL IS HAULED ON **TIMKEN BEARINGS** AT WYOMING MINING CORPORATION

This operator uses only one make of mine car—Enterprise—equipped with one make of bearing—Timken. That simplifies the entire mine car transportation system—makes it easier and more economical to operate and maintain.

Extraordinary results with Timken Bearings are reported from the mine, located at Oceana—the virgin field of Wyoming County, W. Va.

Many other mine operators have found it pays to have all of their cars on Timken Tapered Roller Bearings for then they en-

joy Timken Bearing benefits in full, including maximum train operating speeds to and from the tipple; longer loaded trains hauled without increased power; simplified and economized lubrication; greater mine car availability—more cars in service, fewer in repair shop.

When mixed trains of Timken and plain bearing cars are operated, the plain bearing cars naturally hamper the Timken Bearing cars and nullify their advantages to some extent. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

destroyed, and the poisonous atmosphere will not be carried through the mine. If the air carries a deadly dose of poison, the less ventilation the better, prior to the effective reconnoitering of the area in which a poisoned atmosphere is likely to be found. Then care must be taken to avoid pulling or pushing air onto any men who may be found behind barricades or in areas unfouled to date.

(5) With continuous ventilation to make the air travel continuously, doors are necessary and these have to be opened temporarily cutting off the air from a section of the mine. Such doors may be latched back, regardless of laws or regulations, and may be left open indefinitely or for a long time, thus permitting of the accumulation of methane or bad air.

(6) With continuous ventilation, except for the leakage from the main intake heading to the return, the headings all get the same quantity of air and the best air goes to the most outby heading, which often is the one which needs ventilation the least, and no control is possible.

(7) Continuous ventilation requires doors and, with these, cars may collide, when open or closed, warping them and interfering with the ventilation which the "detour" caused by the door was intended to provide. A collision is not only dangerous; it prevents the door from effecting its purpose.

(8) Continuous ventilation is extravagantly expensive because the air has so far to travel and the resistance to this travel is so great. Split ventilation is less costly.

Low and Narrow Entries

Q.—How does insufficient cross-sectional area decrease efficiency of ventilation?

A.—The quantity of air that will pass

through a heading equals the velocity of the air multiplied by the cross-sectional area, and if the pressure, the distance and the specific resistance per square foot of rubbing surface are the same in each instance, the velocity, it might be thought, should vary as the square root of the area,

for does not $p = \frac{ksv^2}{a}$ where p = pressure, s = area of rubbing surface, v = velocity and a = area?

However, it must be remembered that the periphery of the rubbing surface will differ in its relation to the area of cross-section when the size of this heading increased, so the problem is a little less easily solved than would appear at first sight. As

$$p = \frac{ksv^2}{a}; v^2 = \frac{pa}{ks}. \text{ Thus } v = \sqrt{\frac{pa}{ks}}.$$

Let us suppose the heading is 6 ft. square; then the area will be 36 sq. ft., and the periphery will be $4 \times 6 = 24$ ft. Let the distance the air has to travel be d , then s (which is the rubbing surface) will equal $24d$. Then v , which it has been

shown is equal to $\sqrt{\frac{pa}{ks}}$ will equal

$$\sqrt{\frac{p \times 36}{k \times 24d}} = \sqrt{\frac{3p}{2kd}} \text{ As } q = va \text{ it must}$$

also equal $a\sqrt{\frac{3p}{2kd}}$ or $36\sqrt{\frac{3p}{2kd}}$. We are

intending to obtain comparative and not actual values for quantity of air, with pressure, coefficient of resistance and distance all unchanged in our calculations, so any value for them, however unreasonable, may be taken so long as we adhere to them in the later calculations, consequently we will make all of them equal to 1. Therefore $p=1$, $k=1$ and

$$d=1, \text{ and } 36\sqrt{\frac{3p}{2kd}} = 36\sqrt{\frac{3}{2}} = 36\sqrt{1.5}$$

$$= 36 \times 1.22474 = 44.09064.$$

If the heading were 6×12 ft., then the area would be twice as large, or 72 sq. ft., and the periphery would be $(2 \times 6) + (2 \times 12) = 36$ sq. ft., and q would equal

$$72\sqrt{\frac{p \times 72}{k \times 36d}}. \text{ Again making } p, k, \text{ and}$$

$d=1, q = 72\sqrt{2} = 72 \times 1.4142 = 101.8224$. Thus by doubling width and thereby doubling cross-sectional area, the quantity of air will increase 2.31 times. (This should be remembered because the disposition is to say that the quantity delivered will be in direct proportion to the cross-sectional area, which is not true.)

Excessive Leakage

Q.—How do excessive leaks decrease ventilation efficiency?

A.—Leaks waste air. Some loss of this kind is inevitable, for stoppings are never quite tight and the air leaks through stoppings, over the top and under the bottom of stoppings, finds its way through natural crevices and those made by blasting and stress in the coal and rock, can pass between the top of the coal and the roof, because, contrary to general opinion, there may be little weight on the chain pillar between headings. However, excessive leaks must be avoided, especially between intake and return, for what leaks into the return is lost forever. Leaks at the doors placed between intake headings of a side entry are not so harmful, for then the leaks tend to split the air and save some of it from having to travel along the headings of the side entry. They do not rob the air from any of the workings beyond that side entry.

Pa. Bituminous Firebosses[†]

To Remove Methane

Q.—If you were instructed to remove a large body of methane collected on a goaf fall, how would you proceed?

A.—I would remove all workmen from the mine or from the part of the mine where the body of methane has been found, except those required to aid in the removal of the methane. I would arrange to guard properly all the openings to the mine or to the affected districts of the mine. I would remove all open lights and fires from points around return mine openings and disconnect all electrical connections to the mine area affected. I would select a sufficient force of experienced and reliable men and equip them with portable electric lamps and with approved safety lamps thoroughly tested and examined. Necessary tools, brattice cloth and other supplies also should be ready and available, so that air can be so directed as to remove completely all parts of the body of methane.

The methane should be approached

[†]Continued from December, 1943, p. 80.

from the intake side. Sufficient air should be provided to remove the gas slowly, so as to dilute it to a safe mixture, air connections being opened and closed so as to achieve that result. Check doors and brattices should be erected to pass the methane to the surface by the most advantageous route, and this operation should be continued until the body of methane is entirely removed. Careful tests should be made throughout the operation to note the percentage and rate of removal of the methane.

After the gas has been removed, I would carefully examine the returns, it has traversed, and if in pockets, gobs or room necks, any gas is found, I would direct the ventilating current so that it would be removed. The methane may be ignited or persons may be suffocated unless the safety lamps are carefully handled and the channels through which the methane has passed are guarded and protected. Too large a body of methane in motion is also dangerous, for it may be ignited. The ventilation also must be kept under control. (5 percent)

How Much Gas in Return

Q.—If 29,100 cu.ft. of air enters a split in which 60 persons are employed, and 30,000 cu.ft. returns therefrom, the increased quantity being due to the addition of methane, what percentage of methane is in the air at the return of the split?

A.—The quantity of methane must be $30,000 - 29,100 = 900$ cu.ft. The ratio of the number of cubic feet of methane to 100 cu.ft. is the percentage of the methane, and in this case this must be equal to:

$$\frac{900}{30,000} \text{ or } \frac{3}{100} = \frac{3}{100} = 3 \text{ percent}$$

Thus, the air of the return of the split contains 3 percent of methane (4 percent).

Q.—When is an approved safety lamp unfit for use?

A.—An approved safety lamp is unfit for use when it is improperly assembled, contains any defective parts, is dirty or does not withstand the test. A part left out may leave a hole through which flame may pass. In the hands of an incompetent person, no safety lamp is safe. (2 percent).

GOOD GUIDES

TO BETTER WIRE AND CABLE PERFORMANCE

- Send for the Hazard catalog—"Electrical Cables for Mining Use"

- Standardize upon as few sizes as possible.

- Expedite production by keeping your cable design simple.

- On problems of selection, call on your Hazard representative for assistance by writing, telephoning or telegraphing the nearest sales office.

- Store in a cool, uniform temperature location.

- Keep reels and coils off the ground. Continued exposure to moisture rots wooden heads and fibrous coverings.

- Protect cables from the weather.

- When cables get caught on obstructions, don't pull them loose. Lift them free.

- Don't let equipment roll over cables. This leads to broken or shorted wires.

- Keep gathering reels in proper working order to avoid run-overs, jams or jerks.

- To avoid overloading and overheating shovel cables, pull the full length off reels. Three layers of cable left on a reel will reduce the current rating by as much as 50%.

- Don't use your mining cables as tow ropes. Towing stretches the conductors, decreases capacity and pulls insulation loose.

- When shifting the location of a strip-mining operation, improvise a simple, semi-circular yoke instead of dragging the cable with a rope or chain hitch. The sharp bend resulting from the latter method may weaken cable and insulation at this point.

- Wipe portable cords and cables regularly so that they are free from grit, grease and chemicals.

- When splicing is necessary, use care in wrapping the joint, and for best results, vulcanize the repair.

- Order as far in advance as possible, to allow time to apply for material allocations.

- Include proper preference rating, and C.M.P. authorization.

- When special power cables are ordered:

- (a) supply us with cutting lengths promptly;

- (b) include end use and conditions of installation.

- Don't run cords and cables over too small diameter pulleys or drums. Use larger diameter pulleys.

- Locate cords and cables to minimize interference with normal traffic.

- Protect borehole power cables from damage or sabotage by concealed secondary supports.

- Shift cords and cables away from high-voltage equipment and sparking motors. The ozone generated will attack rubber.

- Ask these offices for help.

Atlanta 3, Ga. New Orleans 12, La.

Birmingham 3, Ala. New York 17, N. Y.

Boston 16, Mass. Philadelphia 3, Pa.

Buffalo 17, N. Y. Pittsburgh 19, Pa.

Chicago 6, Ill. San Francisco 4, Cal.

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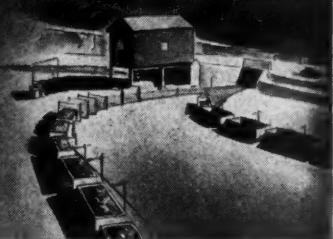


HAZARD



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TIMELY OPERATING IDEAS



Streamlining Locomotive Electrical Control

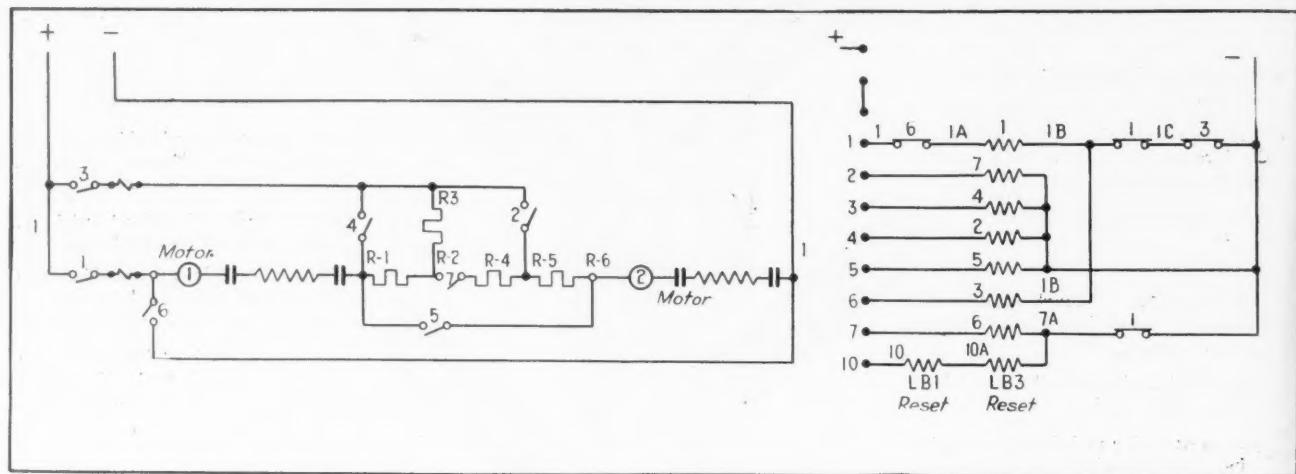


Fig. 1—Simplified main circuit diagram.

Fig. 2—Original control circuit.

"**PERHAPS WITH** coal-mining equipment more than any other type of machinery, the field performance does not always meet the expectation of the designers," remark Michael Sapko, master mechanic, Ocean mine, and Clyde Rugh, master mechanic, Warden mine, Pittsburgh Coal Co., in detailing methods employed to streamline the electrical control on a mining locomotive. "That is, sometimes even well-designed and tested equipment gives poor performance and high maintenance due to difficulties not foreseen. After usage and experience develop these defects, the manufacturer makes notes and improves the design. However, the maintenance man must now either correct the equipment on hand or endure difficulty in its operation.

"An experience of this nature was encountered by the Pittsburgh Coal Co. in the operation of a popular 550-volt d.c. 8-ton cable-reel locomotive. This locomotive, as originally built, had seven contractors operated from a master controller. In keeping with standard practice, over-load relays and interlocks were included in the control.

"Unfortunately, these auxiliaries did not always perform as desired. When they did function they either burned off due to the arc hanging on or they flashed to ground and started fires and charred the insulation. Sometimes, it was only a poorly adjusted contact but in any case the locomotive was out of production until it could be reached and repaired.

Fig. 3—Modified control circuit.

"The switching of 550 volts d.c. with heavy contacts, arc chutes and blowout coils can be accomplished fairly successfully, but light-duty contacts and auxiliaries have always been considered a potential source of trouble, particularly on 550-volt d.c. service. Therefore, rather than attempt to improve the auxiliaries and interlocks, it was decided to eliminate those possible and simplify the wiring at the same time.

"From operating this locomotive, it was known to be so well motored that the wheels would spin on sand before it would stall under load and damage the motors and resistance. The simplification was accomplished by eliminating (Fig. 2) No. 1 and No. 3 contactor-reset coils together with their auxiliary contacts; also the auxiliary contacts on No. 5 and No. 7.

It was necessary to retain one auxiliary on No. 1 and No. 6 contactors, since if either one stuck closed and the other was closed by the controller a direct short of the trolley to the ground would result (Fig. 1).

"Fig. 1 shows a simplified main circuit diagram. Fig. 2 shows the original control circuit. Fig. 3 shows the control circuit after it has been modified. Of course, the 80- or 100-amp. fuse is retained in the cable tap and trolley pole. Also, as an additional protection, a 125-amp. fuse in a standard cable tap is connected in the positive lead inside the contactor case. It is important to have the heavier fuse inside the contactor case since this case, like all permissible sealed equipment, is quite a task to open and must be resealed.

"The original locomotive this idea was tried out on has been in daily service for 18 months; another for 14 months. Additional locomotives at all Pittsburgh Coal Co. mines are being wired in this manner as fast as they come in for repairs. We find the electrical maintenance of these older locomotives to be as good as the latest model of the same design. Experience has shown us to save about three hours production and maintenance loss per locomotive per six-day week, plus the saving of material by this rearrangement. The novel part of this idea is that you increase production and reduce costs in vital times by discarding parts now in use rather than purchasing new parts to promote an improvement."



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KOEHLER *Flame* Safety Lamp

The Koehler Flame Safety Lamp incorporates all of the requirements for essential safety and satisfactory operation needed in a safety lamp:

EFFICIENCY • ADEQUATE LOCKING DEVICE •

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The Koehler Flame Safety Lamp is fully approved by the United States Bureau of Mines—it has a perfect rating. Write today for new folder giving complete details—it will be mailed free.

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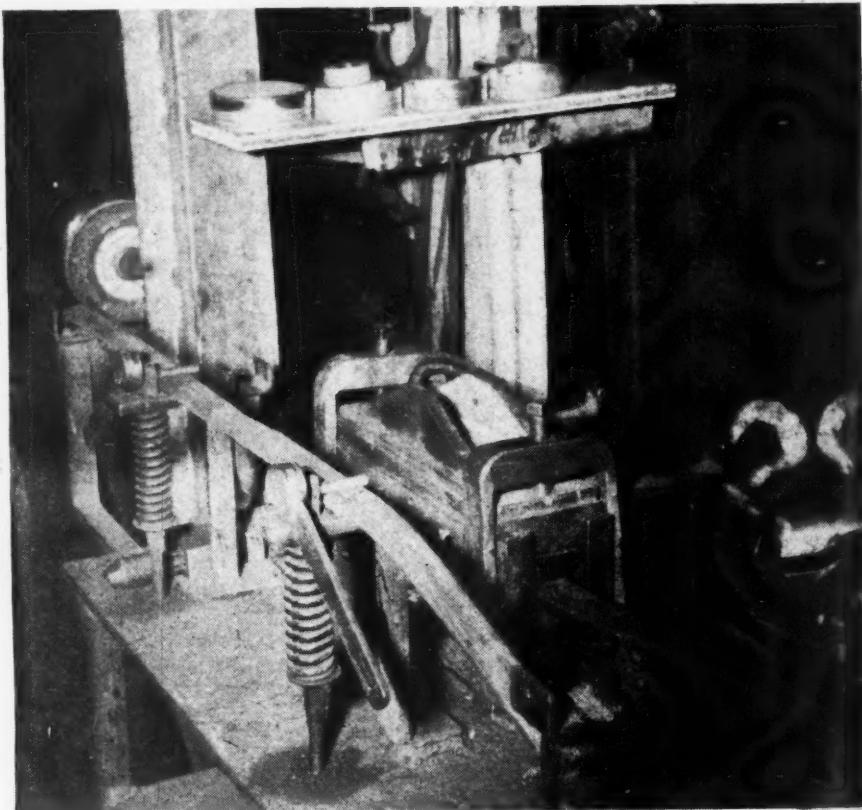
Quick-Acting Spring Clamps Facilitate Cable Work

IT IS IMPORTANT to have a quick and convenient method of holding and adjusting the ends of trailing cables while they are being repaired with permanent splices. The type of cable support and vise devised and used in the shop of the Powhatan Mining Co., Powhatan Point, Ohio, is shown in the illustration.

The clamps are spring-closing type and are released by turning a lever and cam over to the opposite side. This cam raises the pin against compression of the spring. Brackets spaced 2 ft. from each clamp support the cable so the ends line up. To show the top construction of the support, the cable was taken out of the bracket nearest the camera.

This view shows a vulcanizer with a cable being cured in it. Its mounting is on the same small steel table with the splicing clamps. This vulcanizer is electrically heated instead of using steam as a heating medium. Thermostats in the unit turn the current on and off. In making the cable splices the stranded conductors are joined with short copper sleeves swaged tight with an M.S.A. explosive gun.

The splicing equipment consists of two of the tables complete with the vulcanizers and clamps, both installed in the machine shop, which is on the outside and close to the shaft. It was about a year ago that vulcanizing was adopted at this full mechanical mine, which is the largest single producer in the State.



One of the two splicing and vulcanizing tables in the Powhatan shop.

Trolley-Fed Warning Light Mounted in Standard

AS A QUICK and convenient means of providing a warning light for use when men are working on wire, track or other equipment along a haulage road, Mine No. 120, Consolidation Coal Co., Acosta, Pa., employs the standard shown in the accompanying illustration.

At the top of the standard is a metal contact piece with a groove in it into which the trolley wire fits. The upper part also includes a light socket and bulb in a metal frame. The lower part of the standard is made in two parts so that the upper can be slid up or down to alter the height of the unit. Two metal bands permit this sliding action and the top one is fitted with a set screw to permit clamping the two halves tightly together when the length is adjusted. A loop of rubber-covered wire connects the two halves and metal clips on the bottom fit over the ball of the rail. The wire loop is long enough to permit reasonable adjustment of the length.

To put the device into use, the clamp is loosened, the lower end is set on the rail, the upper end is run up until the trolley wire rests in the groove, and the clamp is tightened. The bulb then burns until the standard is removed.

A sliding adjustment permits installing this warning light anywhere along the line.



Big Job Ahead

With production goals set at new highs and equipment, materials and manpower still tight, coal-operating men face even heavier responsibilities in 1944. Now, if ever, a good idea should be worth its weight in gold. Coal Age is looking for such ideas as its contribution to the big job ahead. If you have a production-boosting cost-saving electrical, mechanical, operating or safety idea, here is the place for it. So send it along with a sketch or photo if it will help to make it clearer. For each acceptable idea, Coal Age will pay \$5 or more on publication.

Built to set the pace

and HOLD IT!

After more than a decade of service in all types of heavy-duty mining equipment on the kind of jobs that really put power "through the wringer"—this fact about Cummins Dependable Diesels stands out like an unbroken window in Berlin: They are built to set the pace in dependability, economy and speed—and hold it! Day and night...until the job is wrapped up and delivered.

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Columbus, Indiana



...it new
aterials
, coal-
heavier
Now, if
e worth
Age is
its con-
head. It
boosting
mechanical
here is
it along.
if it will
For each
Age will
cation.

Power Hoist and Hand Line Grabs and Raises Rope

AT THE TOP OF a car incline at the Princess Dorothy Coal Co., Eunice, W. Va., raising the rope to a sheave at empty-track elevation is mechanized in an unusual way. From his operating station the drum runner does it with the aid of an electric hoist by manipulating a small manila hand line and a reversing switch.

Two cars at a time, each car loaded with 5.85 tons of coal, are lowered on a 900-ft. 18-deg. mountainside plane from No. 2 mine level to the main haulage, which through No. 1 mine delivers to the main headhouse. The plane operates on the gravity system with empties pulled up by the descending loads.

Referring to Fig. 1, an electric hoist handling a chain over a notched sprocket or sheave is in the extension structure which is at the level of the floor of the drum runner's room. In this illustration the hook B has raised the $1\frac{1}{2}$ -in. rope D to the necessary height and is about to lower it into sheave E. It is being guided by the drum runner through the medium of hand line A, which is permanently attached to the hook. The strand of chain to the right of that one marked C is the idle part that has gone through the sheave of the hoist.

How the hook B and chain C are pulled up out of the way of the descending loaded cars is indicated by Fig. 2. For this position the drum runner pays out the chain and pulls in the handline to raise the hook.

To grab the rope D, Fig. 3, he pays out the handline and usually succeeds the first time in making the hook catch. Failing the first time, he reverses the hoist and makes another try. Years ago it was not uncommon to see one or two men employed to raise the rope manually.

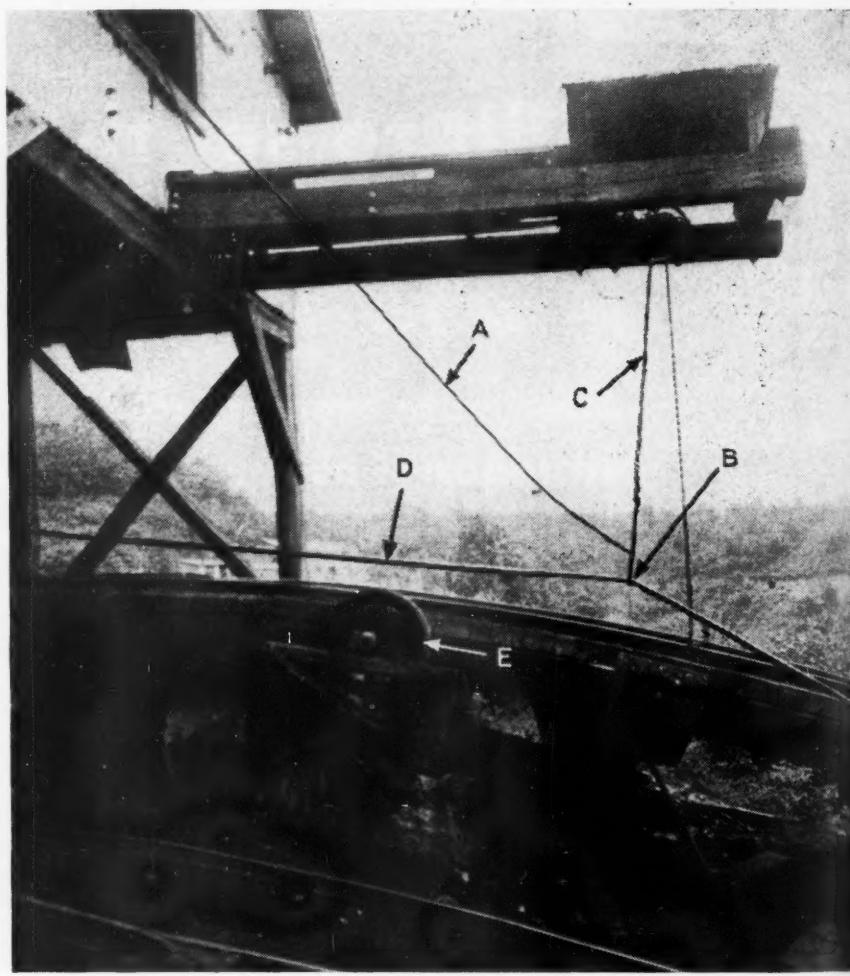


Fig. 1—About to lower the rope into the sheave.



Fig. 2—Rope of empty trip has been placed in the sheave.

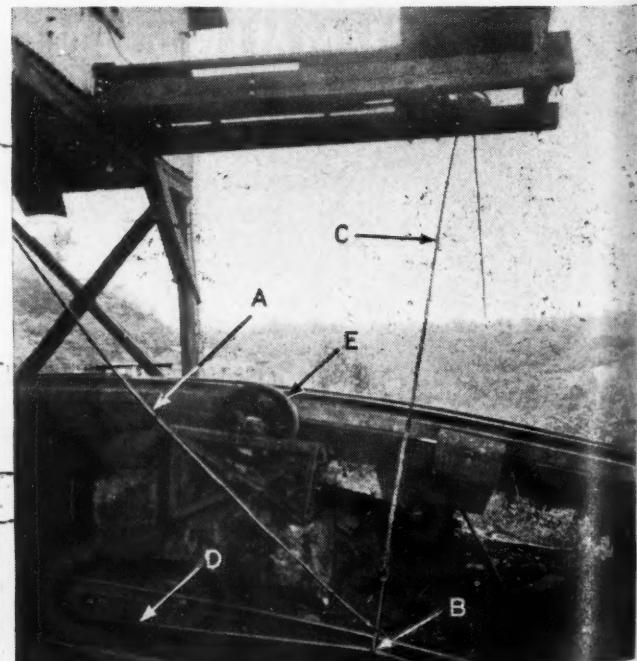


Fig. 3—Raising the rope after a trip has landed.



**IMPORTANT
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STEEL AXLE

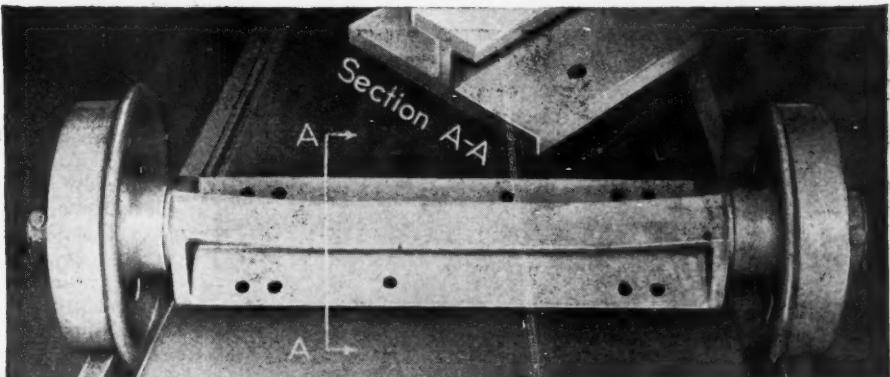
CAST STEEL WHEELS

★ With treads cast to an accuracy almost equal to a machined surface. The quick, dependable way to build your own mine cars in your own shops—use the DUNCAN Integral-Cast Steel Axle and cast steel Wheels.

Careful control of chemical properties and proper heat-treating make DUNCAN Integral-Cast Steel Axles equal in strength to a rolled axle. They weigh 150 lbs. and replace 225 lbs. of weight. The following results were obtained by placing two axles in hydraulic press, each bolted flat to a 100-ton press and bent to a 30° angle on each end of axle—CAST AXLE . . . 225 tons—ROLLED AXLE . . . 200 tons—neither axle showing fracture.

Axes have been used for years on automotive trucks and trailers with satisfaction. Investigate today and see how you can use them to your benefit—let us tell you how mines can save money, time, and labor with DUNCAN Integral-Cast Steel Axles and cast steel wheels.

DUNCAN FOUNDRY & MACHINE WORKS, INC., ALTON, ILLINOIS



Keeping Trailing Cables in Trim

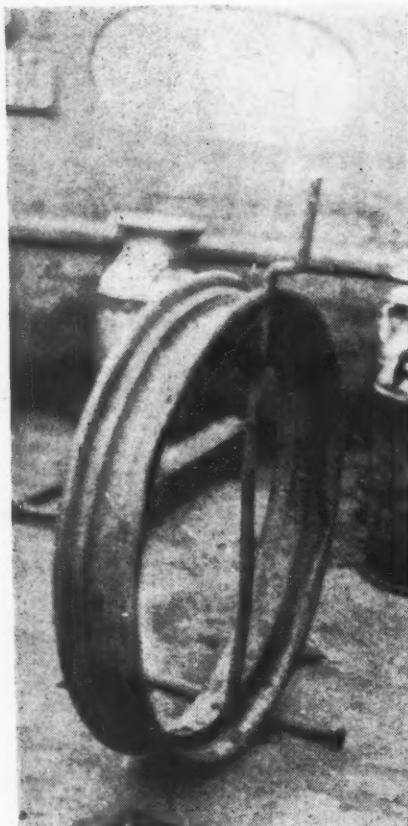


Fig. 1—Showing how rim is adapted to cable moving.

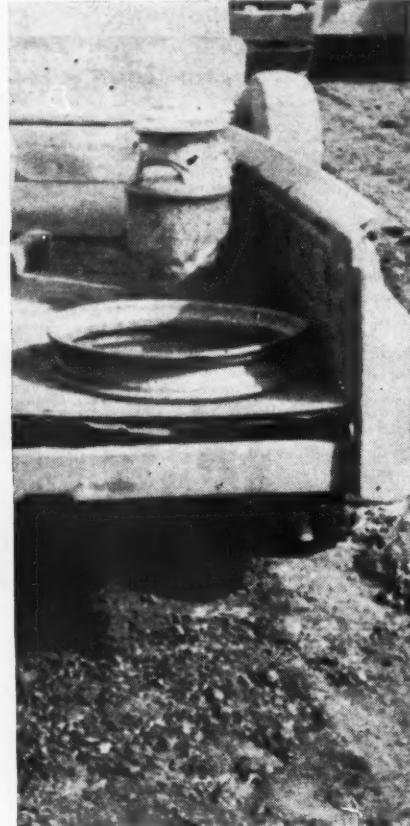


Fig. 2—The rim may be swung to one side or removed altogether.



Fig. 3—Cable looped on and ready to go.

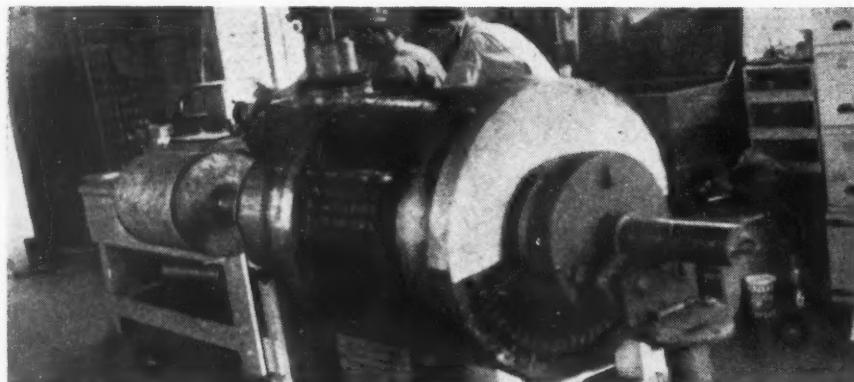
NO ELECTRICAL APPARATUS, probably, is more abused than trailing cables used in underground and strip mining. Many warnings have been broadcast to keep loads, layers and temperatures within limits. Not enough, perhaps, has been said about avoiding kinks and short bends. Enough of such abuse is fatal to both conductors and ground wires. The only safe practice is to avoid the appearance, even, of evil.

The accompanying illustrations show one way the Fiatt mine of the Truax-Traer Coal Co., Canton, Ill., uses tire rims to drag stripping cables from place to place without kinks or rope hitchings. All pick-up trucks and utility tractors are equipped. When a cable is to be moved, the most convenient vehicle is called to the job. There is no waiting.

To adapt a rim to cable-moving service

a rod is welded to it as shown in Fig. 1. The end sticking up has two right-angle bends. When dropped through a hole in the steel truck floor and the rim laid down, it is ready for the cable. The rim may be swung to one side out of the way or removed altogether when not in use (Fig. 2). When the rim is swung straight back and a cable is thrown over it (Fig. 3), the driver is ready to go.

Beating the Rats to Armatures



Galvanized covers afford needed armature protection.

"BELIEVE IT or not," John H. LaGrand, chief electrician, The Mackie-Clemens Fuel Co., Pittsburg, Kan., has had trouble with rats gnawing the insulation of stored armatures. His cure is effective.

The illustration shows an armature with its directly connected exciter armature. The latter is completely incased in a galvanized covering. The construction of the cover can be seen from the half end cover on the main armature. The lid-shaped ends hold the body cover in place and tape or wire binds the end halves of the case together.

This system of protection is especially suitable for armatures that must be stored in out-of-the-way places for long periods of time.



There's a NOLANEER for every car dumping job!

Nolan Rotary Car Dumpers are built in suitable lengths for multiple car dumping, with a number of automatic and semi-automatic drive and control features.

No matter how large or how small your mine . . . no matter what type of cars you use, how many you use, or how you want them dumped . . . there's a *proved* Nolan Mine Car Dumping and Control Device to aid production for you.

You'll find NOLANEERS in hundreds of mines throughout America. They are the guiding forces in the swift dumping of coal and control of mine cars with NOLAN units, saving precious time, labor and money.

Nolan Single and Multiple Rotary Car Dumpers will easily dump four to six cars a minute, coupled or uncoupled. Sturdy construction is a feature of the Nolan Car Dumper. Rings and trunnions are made of alloyed cast steel carefully machined; the cage structure is of heavy structural sections and plates. Heavy rigid base frames main-

tain wheel bearings in permanent alignment and carry baffle sheet supports, making entire unit compact and quickly installed.

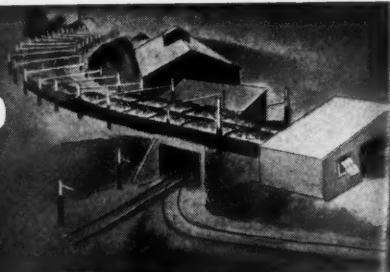
Nolan Rotary Car Dumpers turn a full revolution at each operation. Starting is by a convenient hand lever operating mechanical rail aligning stop and motor contactor. The dump completes its cycle automatically. The dumping principle allows the handling of material with rigid, solid body mine cars, resulting in cheaper first cost, reduced maintenance, and far less coal degradation.

Write for complete information on Nolan Rotary or Gravity Car Dumpers, Trip Feeders, Car Hauls, Automatic Cagers, Platform and Self-Dumping Cages, Cushioned Car Stops, and Mine Car Retarders.



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COAL AGE NEWS ROUND-UP



Operators, Union Sign Contract

Agreement Based on Ickes-Lewis Pact Is Contingent on Price Increase — Portal-to-Portal Settlement of \$40 Is Included As Long Negotiations End — Bituminous Output Hits New Peak

BITUMINOUS COAL operators representing an estimated 65 per cent of the nation's tonnage signed a wage agreement with the United Mine Workers at Washington Dec. 17. The agreement expires March 31, 1945. Operators of southern mines did not sign the agreement.

The new contract is practically identical with the U. S.-UMW agreement of Nov. 3, with the addition that it includes payment of \$40 to the miners in settlement of all portal-to-portal claims incurred prior to April 1, 1945.

Effect of the agreement is contingent on a price adjustment.

Paragraph 16 of the agreement contains a provision for opening negotiations for a new agreement at the end of the first contract year. It reads: "This supplemental agreement, as to general wage rates, may, on thirty days' notice from either party, be reopened for negotiation at the end of the first contract year (March 31, 1944). The foregoing sentence shall not preclude the parties from mutually agreeing at any time during the term of this supplemental agreement on changes in general wage rates, subject to such approval by the appropriate governmental agencies as may be required by the Act of Congress of Oct. 2, 1942, and the executive orders and regulations issued thereunder. Furthermore, if at any time during the term of this supplemental agreement a significant change occurs in the government wage policy, either party shall have the right to request negotiations on general wage rates."

Awaits Board's Approval

Operators signing the agreement represented tonnages in the northern Appalachian area, Indiana, Illinois, Alabama, and most of the districts west of the Mississippi River. Some of the operators, for reasons of travel conditions or otherwise, were unable to be present. Operators represented by the Southern Coal Producers Association, did not sign the agreement, and President Edward R. Burke explained their position with a statement to the conference, in which he objected principally to the travel time features of the contract.

The agreement was despatched, along

with a letter of explanation, to Ickes and to the War Labor Board. It is understood to have the approval of most operators in the northern section of the country, including northern West Virginia, practically all the operations in Alabama, a large number in the West, and principal captive mines.

Ickes announced that a new 16-year high had been set for bituminous production during the week of Dec. 11 when 12,975,000 tons was mined, bringing the year's total so far to 554,725,000 tons against 551,712,000 for the corresponding period in 1942. He also said nearly 15 percent more coal had been received over American docks on Lake Superior during the 1943 season than in 1942, about 300,000 tons. The total received was 11,111,625 tons.

The secretary said bituminous production was the highest since 1927, but pointed out that at that time, 200,000 more men were employed.

"Gratifying as they are," he said, "these increases in current production are not enough. A production of 13,000,000 tons must be maintained through the winter if current requirements are to be met without

reducing stocks to more dangerous levels."

Renewal of negotiations between the operators and the union took place in Washington, D. C., Nov. 17, at the behest of Secretary Ickes. The basis was the government-U.M.W. contract signed by Ickes Nov. 3. As the negotiations continued, additional groups of operators came in upon their own accord and at the urging of Ickes, until by Nov. 30 some 67 percent of the bituminous tonnage was agreeable to a decision to go ahead and frame a new agreement.

Southerners Object

The exceptions included the membership of the Southern Coal Producers Association and part of the Alabama operators. These operators took the stand, among other things, that a new contract should provide for eight hours work at the face, rather than an indefinite arrangement based on an assumption of 45 minutes of travel time, which they held was generally too low.

After John L. Lewis had abandoned his stand that the entire industry had to be represented in any new agreement, the conference voted Dec. 1 to start work on a "firm contract" within the limitations of the U.S.-U.M.W. agreement. A negotiating committee of five operators was set up, with two places vacant for the southern group and Alabama. Those appointed to the committee were: R. L. Ireland, Jr., Hanna Coal Co., for the northern Appalachian group; Charles O'Neill, United Eastern Coal Sales Corp., central Pennsylvania; George F. Campbell, Old Ben Coal Corp., Middle West; K. A. Spencer, Pittsburgh & Midway Coal Mining Co., Far West; and Harry M. Moses, H. C. Frick Coke Co., captive operators. As an incentive to Lewis, however, Secretary Ickes made it clear that those who did not sign an agreement would have their mines held for the duration.

Pressure was put on the committee to draw up a contract within two or three days, but the operators offered objections to signing without assurance of adequate prices. The question of WLB approval also came up, with Ickes replying explosively and contending that the board

VITAL TOO

The nation now is embarked on conservation and salvage of still another vital war material—paper. As its part in this program, Coal Age comes out in a smaller trim size this month (no change in quantity of editorial material), which alone represents a saving of approximately 2½ percent. This is only one step in a general program to again reduce magazine consumption by a substantial margin.

Coal Age readers can help, too, by surveying their paper requirements, eliminating unnecessary use, making every piece go as far as possible and, finally, seeing that used paper is salvaged and not destroyed. Paper is a war material. When it is saved, it helps just that much.

Here's the
fellow
who Knows



CINCINNATI CHAINS, BITS AND BARS ARE PREFERRED BY MINERS AND OPERATORS

DEEP down in thousands of mines is an army of men who devote their lives to mining coal. The Cincinnati Mine Machinery Company and its personnel has devoted a lifetime to providing these men with well-engineered, tough, trouble-free coal cutting equipment. Cincinnati Chains, made of high-grade alloy steel, heat-treated and drop-forged, are preferred by machine runners because they can produce maximum tonnage with minimum effort. Repair and maintenance men say Cincinnati Chains give less trouble and are easier to service. Popular, too, is the long life, sturdy, double-ended, reversible Duplex Bit.

This long-life replaceable hardened alloy steel Connector Insert gives new factory joint accuracy to worn connector.

Easily removed alloy steel heat-treated Rivet holds Bearing Pin against longitudinal displacement.

Hardened Eccentric Pin is designed so it can't turn in block... placing joint wear between pin and insert.

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would accept the new agreement if drawn up in the right way. "You know what the government will approve because you know what it has approved," he declared. Ickes also took to task Walter Kelly, spokesman for the Tennessee Coal, Iron & R. R. Co., who was not prepared to say whether his company would go along with the northern or southern group. Ickes declared his respect for the firm would be greater if it had replied "No, damn you, no." This same phrase was turned back on Ickes by Edward R. Burke, spokesman for the Southern Coal Producers' Association, when it became his turn to state his position. If it meant accepting the U.S.-U.M.W. agreement, that was his answer to participation in the negotiations, said Mr. Burke. The South, said Mr. Burke, "will continue to work for the negotiation of a satisfactory contract that will pay the miners an adequate wage, produce all the coal the country requires and permit the mines to be operated if not with a profit at least without loss."

Southern Group Out

The southern group therefore was not included in the negotiations which got under way Dec. 1 at the Statler Hotel, Washington. The first day brought reports of new demands by the union, while the operators, on Dec. 2, offered a contract version which the miners found in part unacceptable.

Refusal of the southerners to participate brought a long blast from Ickes on Dec. 2 at a press conference, in which J. D. Francis, president, Island Creek Coal Co., was singled out for particular attention. "Well, Mr. Francis is also a sit-stiller," Ickes stated in replying to a question. "He was in here on my invitation on Nov. 15 when I had some other operators in, but he hasn't shown up since. I think he's the principal devil in the southern operators' machine. I think Burke does more or less what Francis tells him to do, and Francis has no interest in the mining properties he operates. He's an employee manager."

Ickes' statements brought immediate rejoinders from Messrs. Burke and Francis.

Again alluding to the assumption of 45 minutes of travel time as not in accord with the facts, Senator Burke declared "we have told Mr. Lewis and we're telling Mr. Ickes now that we are not joining with you to bring pressure on a duly established government agency (WLB) in the hope that it will do what it cannot do and approve a violation of the Stabilization Act."

Island Creek has but one representative out of 25 in the Southern Coal Producers' Association, said Mr. Francis, who pointed out that the company's stock was held by some 5,000 stockholders, including himself and his family, while there were approximately 700 Pond Creek Pocahontas Co. stockholders. As to his alleged refusal to cooperate, Mr. Francis pointed out that in August, 1943, he urged on Secretary Ickes' office the establishment of an eight-hour day and six-day week, following this up with a request to the United Mine Workers in September until the end of the lake season, without any increase in prices for this temporary period. These requests, said Mr. Francis, were turned down.

"We agree," he declared, "with the position taken by the Southern Coal Producers' Association that an attempt to apply the Illinois agreement to the southern mines would be a violation of the Stabilization Act and the rulings of the War Labor Board, and our companies will not be a party to a movement to force the War Labor Board or the Office of Price Administration to depart from their legal duties due to any threatened economic force."

In anticipation of eventual submission of an operator-union contract to WLB, the special committee charged with ascertaining travel time took positive steps to get the necessary data. This committee, appointed by the President had, by Nov. 29, forwarded to all bituminous mining companies with underground operations and contracts with the United Mine Workers, and to all local unions, a letter and questionnaire to be filled out and returned. The committee, in addition, appointed

some 42 joint district committees throughout the country to expedite the completion of the travel-time study.

Hearings on the Jewell Ridge portal-to-portal case were completed in the federal court at Roanoke, Va., Dec. 3. The plaintiffs (Jewell Ridge and intervenors) were given until Dec. 20 to file briefs. The defendants were given ten days thereafter to file replies.

Approval of a Progressive contract was another development of early December. WLB announced its approval of the agreement between the Coal Producers' Association of Illinois and the Progressive Mine Workers of America on Dec. 3. The agreement in general provides for continuance of the basic 35-hour week with time and one-half over that period; increases the vacation payment from \$30 to \$50 per year; provides for payment by the operators for tools used by the miners; and prescribes a payment of \$40 to each miner working from April 1, 1943, through Nov. 1 "as a retroactive adjustment and in full settlement and discharge of any and all portal-to-portal travel-time compensation prior to Nov. 1, 1943."

A "favored-nations" clause reads as follows: "During the term of this agreement should any competitive field make a contract covering wages or working conditions more favorable to either miners or operators signatory hereto, then this agreement shall be modified so that both sides may receive all the benefits of such more favorable agreement, subject, however, to approval by the proper government agencies."

More Mines Returned

Pending the possible signing of a new industry-wide agreement in soft coal, the organization and activities of the Coal Mines Administration were held at a minimum in December. J. W. Morgan, vice president, C. A. Hughes & Co., Cresson, Pa., was appointed an assistant deputy administrator and began work early in the month.

Return of mines where no strikes had occurred or been threatened since Oct. 25, 1943, continued in December. By Dec. 6, the total number of companies receiving their properties back had increased to 284.

To further its announced intention of preserving the mine working forces, CMA sent the following wire to all regional managers on Dec. 3:

"Immediately advise all operating managers to post following notice conspicuously at all mines and to take action in accordance therewith:

"The patriotism of the mine workers is being demonstrated not only by their production record but likewise by the service of large numbers of the mine workers in the military forces. The continued maximum production of coal for the effective prosecution of the war makes it necessary, however, for all mine workers to stay at their jobs and produce even more than they are producing now. Accordingly, all operating managers are instructed, where they have not already made such requests, to apply immediately to the local draft boards for the deferment of all mine workers employed at their mines and to follow the usual appeal



AND—WHO—PRAY—USES MORE COAL THAN I DO!

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In the charging and discharging of any lead acid battery the exposed parts of the positive grid tend to become oxidized by its electro-chemical action. This peroxidization, as it is called, frequently weakens the member to the point where premature failure takes place.

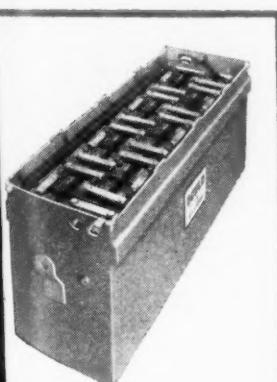
To reduce this hazard and create a grid equal in all respects to the performance of Gould's long-lived positive active material, Gould engineers have designed a new Kathanode grid with a number of outstanding improvements.

These are: (1) a core member buried beneath active material and thus safe from the weakening effects of peroxidization; (2) a box structure that holds in four directions, locking active material in place, preserving life and assuring conductivity; and (3) an enlarged cross-section at top of important vertical members for adequate conductivity under heavy loads.

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*One of a series of service suggestions
for users of industrial batteries.*

► Specific gravity is the weight of a solution compared to an equal volume of pure water. On this scale pure water is one. Concentrated sulphuric acid normally has a specific gravity of around 1.835. Added to water it increases the weight of the solution in direct proportion to the amount of acid present.

For example, in a fully charged industrial truck battery, in good condition, this specific gravity reading is around 1.280, or 1.28 times as heavy as pure water . . . an arbitrary ratio of acid and water that has been found by research and experiment to be the most efficient for this purpose. When this same battery is in a discharged condition it will have a much lower specific gravity, for its electrolyte will contain less acid.

The reason for this difference is that the discharge of a battery is essentially a chemical reaction whereby acid from the electrolyte combines with the oxides in the plates to form lead sulphate. As this sulphate is created more and more acid is taken from the solution and that reduces its specific gravity. Charging operations reverse this action, driving the acid from the plates and back into the electrolyte. From this it is easy to see that a specific gravity reading, the ratio of the acid to water, is an accurate measure of a battery's state of charge.

The use of a well designed hydrometer is the most convenient, and reasonably accurate means of ascertaining specific gravity. These hydrometers come in many styles and, in some cases, are built into the battery. For portable batteries, however, the commonest form is a syringe type that draws off a portion of the electrolyte into a glass tube containing the hydrometer.

The best of these hydrometers are accurate instruments. For reading they should be held so the eye is level with the surface of the liquid and the curvature due to surface tension disregarded. This is necessary because slight differences in the specific gravities of fully charged batteries can be an indication of trouble.

Interested persons may receive full information by writing the Service Department, Gould Storage Battery Corporation, Depew, New York.

procedure if any such request for deferral is denied."

CMA also pressed its efforts to secure price relief for coal mines where the OPA amendment of Nov. 29 (No. 73) to MPR 120 did not provide new ceilings high enough to meet costs. Deputy Administrator Potter, on Nov. 30, sent the following notice to regional managers for transmission to operating managers at bituminous mines:

"Effective Nov. 29, the Office of Price Administration issued revised maximum prices providing for some price increases to meet the increased costs arising from the new wage agreement.

"If your company determines that the sale of the entire production of any of its mines at the maximum prices, as revised, will return a realization less than the representative costs of production at that time, the company should immediately file with the Office of Price Administration an application for adjustment of the applicable maximum prices in accordance with Sec. 1340.207 of Maximum Price Regulation No. 120. A copy of that application should be sent to the deputy solid fuels administrator, Department of the Interior, Washington 25, D. C., so that, where appropriate, representations may be made by the Solid Fuels Administration to the Office of Price Administration with respect to the adjustment applied for."

Temporary price increases granted bituminous mines under Amendment 73 to MPR 120 are given in Table I. The increases finally permitted, subject to later adjustment upon more complete data and fuller study of the cost factors, make allowance for the ability of the various districts to absorb increases, the apparent goal of OPA being to permit no more of an adjustment of ceiling prices than would return cost of production.

New Price Plan

Possibly reflecting widespread complaints from the industry and increased pressure by SFA and CMA, OPA, on Dec. 4, offered still another opportunity for price relief in Amendment 74 to MPR 120, effective Dec. 6. The idea behind this amendment was setting up a method for quick adjustment of ceilings by mines operating at a loss even with the increases provided by Amendment 73.

"Under the procedure provided today,"

COMING MEETINGS

American Institute of Mining and Metallurgical Engineers: annual meeting, Feb. 20-24, Waldorf-Astoria Hotel, New York City.

OPA announced, "high-cost producers must file a formal adjustment of their ceilings on a special report form provided for that purpose. A calculation of increases made in accordance with instructions on a form provided by OPA must be filed simultaneously by registered mail with the formal application. After such filings, and after telegraphic notice of the proposed new ceilings to OPA's Solid Fuels Price Branch, producers may immediately use the new ceiling prices, which are temporary in nature."

Further, "a qualifying mine must also be operating on a six-day-week basis and must not, subsequent to Nov. 30, 1943, have been granted any adjustment of maximum prices either individually, as one of a group or on a district-wide basis. The producer advancing his ceiling by this method must include a statement on each invoice rendered during the period the temporary relief is in effect showing the amount of the addition."

Opinion seemed to be that the extent of the relief provided in Amendment 74 could not be accurately estimated. The OPA attitude seemed to be that in order to insure production it was proper to meet the cost of production plus "some margin for contingencies" not definitely stated.

In view of the price situation, considerable study of the question of using corporate funds took place in December, and owners not sure of the future or unwilling to continue operations at present prices or as adjusted were urged to report that conclusion to the Secretary of the Interior after making an effort to secure an adequate increase. Counsel of the National Coal Association, early in December, offered a suggested resolution which operators might submit in case it was desired to put the government on notice that the right was reserved "to claim reimbursement for any one or more of the following specific or general causes:

"1. Actual losses or recessions in net

operating income during federal control.

"2. For freezing a wage contract not consistent with the company's present or prospective cost or competitive position.

"3. For inadequate price increases.

"4. For dislocation of the company's competitive relationships; or generally reserving its full rights to just compensation."

Ickes announced the return on Dec. 14 of 88 non-union coal mines at which no strike had occurred or been threatened since Oct. 25. The mines thus returned to private operation by the government were located in Tennessee, Kentucky, West Virginia, Ohio, Indiana, Pennsylvania, Maryland, Michigan, Virginia and Minnesota. They brought to 572 the number of producing companies which have had their properties given back.

SUPPLEMENTAL WAGE AGREEMENT

On Nov. 3, 1943, a memorandum of agreement was executed by Harold L. Ickes, Secretary of the Interior and John L. Lewis, president of the United Mine Workers of America, covering all of the bituminous coal mines of the United States which had contracts with the United Mine Workers of America for a period ending during the year 1943; and thereafter the National War Labor Board by decision of Nov. 5, 1943, and succeeding decisions on dates thereafter, approved and clarified said agreement of Nov. 3, 1943; and under directives issued to the operating managers of the United States all of said mines have been and now are being operated by the Secretary of the Interior.

It is the desire of all signatory parties to carry forward and preserve the terms and conditions contained in all joint wage agreements, effective April 1, 1941, to March 31, 1943, the supplemental agreement providing for the six-day work week, and all of the various district agreements executed between the United Mine Workers of America and the various coal associations and coal companies (based upon the aforesaid basic agreements) as they existed on March 31, 1943: all as amended and supplemented by the aforesaid agreement of Nov. 3, 1943. Now, therefore, this supplemental wage agreement is hereby made and entered into by the signatory parties.

WITNESSETH: 1. The agreements described in the last paragraph above, as amended by the agreement of Nov. 3, 1943 (executed by and between the Secretary of the Interior and the United Mine Workers of America) and as presently being enforced by the Secretary of the Interior, are hereby extended to and including March 31, 1945, upon the same terms and conditions therein contained as heretofore supplemented and amended, except as modified herein. Nothing in this

TABLE I—INCREASES IN BITUMINOUS CEILING PRICES PRESCRIBED BY OPA NOV. 29 IN AMENDMENT 73 TO MPR 120.

	Absorption Available	Per Ton		District	Absorption Available	Per Ton	
		Tentative Estimated Cost Increase	Price Increase			Tentative Estimated Cost Increase	Price Increase
1. Central Pennsylvania	\$0.03	\$0.30	\$0.30	12. Iowa	...	0.36	0.60 ¹
2. Western Pennsylvania	0.08	0.26	0.20	13. Southwestern	0.28	0.31	0.10 ²
3. Northern West Virginia	0.09	0.21	0.15	14. Arkansas-Oklahoma	...	0.38	0.40
4. Ohio	0.05	0.22	0.20	15. Southwestern	0.11	0.13	...
5. Michigan	...	0.49	0.50	16. Northern Colorado	...	0.29	0.50 ³
6. West Virginia Panhandle	...	0.26	0.25	17. Southern Colorado	0.31	0.26	...
7. Southern No. 1	0.11	0.32	0.25	18. New Mexico	...	0.48	0.50
8. Southern No. 2	0.10	0.26	0.20	19. Wyoming	0.06	0.25	0.20
9. Western Kentucky	0.14	0.15	...	20. Utah	0.30	0.25	0.10 ⁴
10. Illinois	0.15	0.15	...	22. Montana	0.18	0.24	0.10 ⁴
11. Indiana	0.14	0.14	...	23. Washington	0.13	0.45	0.35

¹ \$0.20 provided for underground mines loading entirely by hand or shipping entirely by truck in Districts 9, 10 and 11.

² Includes six-day week and creeping-cost adjustment of \$0.30.

³ \$0.20 is provided for underground mines shipping entirely by truck in Districts 13, 17, 20 and 22.

⁴ \$0.25 is provided for underground mines and mines shipping entirely by truck.

⁵ Includes six-day week and creeping-cost adjustment of \$0.25; price increases vary by sizes of coal.



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during Second Quarter of 1944
for Third Quarter construction
of mine cars. File your
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your inquiries NOW

THE MINE CAR OF TOMORROW *has already been built*

COAL company haulage experts and mine car builders who have worked on the problem agree that the ideal mine car must fill three basic requirements:—

- it must have maximum hauling capacity
- it must have minimum deadweight per cu. ft. capacity
- it must be strong and rugged to stay on the job.

With the advent of COR-TEN almost nine years ago the ideal material for such construction became available.

As car builders discovered the possibilities of this superior low-alloy, low-cost, high tensile steel, mine car design and construction were progressively improved with a resultant step-up in efficiency that was immediately reflected in greater output, lower operating costs and decreased expense for maintenance.

More than 10,000 COR-TEN mine cars are already in use. Some of them, built just be-

fore COR-TEN was limited to direct application in war equipment, are admittedly years ahead of their time.

Today, in mines operating at maximum capacity, this high-efficiency COR-TEN equipment is already demonstrating what tomorrow's mine cars will have to offer.

COR-TEN can be used to improve the efficiency of any type of car. For COR-TEN is a versatile steel, that is readily fabricated by all the usual shop methods and, in addition, lends itself well to whatever variations in design and dimensions are necessary to meet local operating conditions and users' preference.

Remember these facts when you plan for tomorrow. Even though COR-TEN is today not available for mine car construction, it will be back when the fighting is over—to help make your equipment lighter, stronger, long-lasting and more economical to operate.

U.S.S. Cor-Ten is strong. It has a yield point more than 50% higher than structural quality open hearth steel. It is tough and hard-wearing. Highly resistant to shock and vibration, it has 1/3 greater resistance to abrasion than mild steel. And important in coal mine equipment, COR-TEN has unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper steel.

But you pay no premium for using this superior steel, for COR-TEN in thousands of mine cars has proved that it will safely reduce weight with little or no increase in cost. It's not too early to find out what COR-TEN has to offer.

AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago and New York
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UNITED STATES STEEL

agreement is intended to alter or to depart in principle from the memorandum of agreement of November 3, 1943, as approved by the National War Labor Board.

Terms and Conditions of Employment.

1. By reason of the emergency and as a contribution to the public welfare the work day shall be extended as follows:

(a) For all inside employees, a work day of eight hours and 45 minutes (including an assumed 45 minutes for travel time) is established with an intermission of 15 minutes for lunch which is not paid for, making a nine-hour day over-all;

(b) For all outside employees (including all strip mine and coke oven employees) a work day of eight hours and 15 minutes is established, seven hours of which shall be paid for at straight time and 1 1/4 hours at time and one-half, with an intermission of 15 minutes for lunch which is not paid for; making an 8 1/2 hour day over-all.

(c) For outside employees whose normal work day heretofore has been eight hours, a work day of eight hours and 35 minutes is established, for the first eight hours of which they shall be paid their present rates and for the last 35 minutes of which they shall be paid time and one-half at their hourly rates based on a seven-hour day.

When breakdown of equipment, accidents, shortage of transportation from the mine, or other causes beyond the control of the management prevent; provided, however, that lack of market demand is not to permit the management to operate on less than an 8 1/4 hour shift for inside employees and on less than an 8 1/4 hour shift for outside employees;

Time and one-half shall be paid for any time worked in excess of the regular shift in any consecutive 24 hour period or in excess of 40 hours in any one week, provided that this principle shall not be used to pyramid the payment of overtime, and provided further that time and one-half shall not be paid where the regular rota-

tion of shifts requires the working of more than one shift in any consecutive 24-hour period.

2. For all inside employees, work time shall begin at the portal and end at the portal; but in shaft mines, for the purpose of making the operations of lowering and hoisting the men orderly and safe, the man-trips shall leave the bottom 10 minutes after the start of each 8 1/4-hour shift and shall arrive at the shaft bottom five minutes before the end of each 8 1/4 hour shift (it being understood that the 8 1/4 hours are exclusive of the lunch period). Employees shall be at the shaft collar in time for all of them to be lowered so as to be in the man-trip at the scheduled departure time. The operator shall have the right to designate the portal or portals and may move or establish new portals if adequate facilities, conveniences and safety are furnished the mine workers at such new portals, subject to the right of review on the part of the mine workers under existing grievance machinery.

3. All inside employees working on a day wage basis shall be paid the established regular hourly rate provided in the applicable district or other agreement; subject to the increases provided in paragraph 6 herein, at straight rate for eight hours of productive time in each day during the week (assuming 45 minutes travel time for each day) and at a special rate equivalent to 2/3 of the established regular hourly rate for the assumed 15 minutes of travel time in each day: provided, however, that time and one-half the regular established rate shall be paid for that portion of the productive time worked during the first five work days in the week after 10 hours have expired (assuming 45 minutes travel time for each day): provided, that for all productive time worked in the sixth day worked by any employee in each week, time and one-half the regular established hourly rate shall be paid; and provided further, that time and one-half the special rate for travel time (equivalent to

2/3 of the regular established rate) shall be paid for all travel time after 40 hours have expired in the week (assuming 45 minutes travel time for each day). This paragraph is not to be construed to require payment of time and one-half on Saturday if the individual mine worker has not worked on Monday, Tuesday, Wednesday, Thursday, or Friday of the week. In no case shall the payment of overtime be pyramided.

4. For all inside tonnage, footage and yardage (piece) workers, the parties have assumed an average travel time throughout all areas of 45 minutes each day. The compensation for all such workers shall be computed as follows:

The average rate of earnings per hour for productive time for each individual mine worker shall be determined by dividing the total earnings for that mine worker at the existing regular established rates for all tonnage produced and yardage or deadwork done during the week or pay period by the number of hours worked at the face during that week or pay period (assuming 45 minutes travel time for each day). This average rate of earnings shall then be paid to the mine worker for all hours of productive time worked in the week (assuming 45 minutes travel time for each day): provided, however, that one and one-half this average rate of earnings shall be paid to the mine worker for all productive time worked after 40 hours have expired in the week (assuming 45 minutes travel time for each day).

5. The man-trip motor crew is to be paid straight time for the first seven hours worked and rate and one-half for all other time worked over seven hours, provided however, that for all time worked on the sixth consecutive day, time and one-half shall be paid. Travel time for man-trip motor crews in shaft mines shall be assumed to consist of 15 minutes per shift, and such travel time shall be paid for at the travel time rate; all the additional time worked (excluding the lunch period) shall be paid for at straight time for the first seven hours worked and time and one-half for all hours over seven worked in each day.

6. The existing rates of compensation for able-bodied trappers, flaggers, switch throwers, greasers and slate pickers shall be increased in all areas in accordance with the principles applied by the National War Labor Board for the Appalachian area in its directive order of June 18, 1943.

7. For each mine where the practice now prevails, the delivery of cars to the working places in the mines by pushing will be the subject of local negotiations and will not be prohibited where it is impracticable to deliver them to the working place otherwise than by pushing. Any controversy as to the continuation of the practice where it now prevails must be considered as a dispute, and shall be settled promptly in accordance with the customary grievance machinery.

8. All employees at mines which produce coal six days per week shall be given a fair and equal opportunity to work on each of such six days. Laying off individual mine workers during the week for the purpose of denying them six days' work is prohibited.

Work performed on the seventh consecutive day is optional, but when performed shall be paid for at double rates.

9. The management shall furnish all necessary mine workers' tools at the management's cost. At the option of each tonnage mine worker, where the management has not already purchased the tools owned by the worker or entered into some satisfactory settlement with respect to that matter, the management shall purchase and the mine worker shall sell the tools the tonnage mine worker owns at a price which is equal to one cent per ton for all coal mined by each tonnage mine worker between April 1, 1943, and November 3, 1943, with a minimum payment of \$3.

Safety equipment and devices including electric cap lamps, and also carbide lamps shall be furnished by the management without charge. This shall not include, however, personal wearing apparel such as hats, clothing, shoes and goggles. In



"HERE COMES OLD. 'WELL HOW ARE THINGS GOING TODAY IN NUMBER SEVEN, BOYS.'"

DESIGNED FOR THE JOB... ...BUILT FOR THE YEARS!"



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STEEL
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HANDLE
REINFORCEMENT
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Shovels are made to
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lieu of furnishing carbide lamps and carbide, the operator may, at his option, pay to the mine workers who use carbide lamps at their work 6c. per day, and the mine workers shall continue to furnish their own carbide lamps and carbide.

No charge shall be made for blacksmithing.

10. Any grievances or disputes as to the starting time shall be handled in accordance with the established practices for the adjustment of such grievances.

11. The provisions relating to vacations with pay are hereby amended to substitute, at appropriate places therein, fifty (\$50) dollars for twenty (\$20) dollars.

In the interest of the national war effort, it is agreed that the vacation period shall be eliminated for the year 1943 without prejudice to or modification of the existing vacation clause of the agreement. This arrangement shall in no wise affect the payment of fifty (\$50) dollars to be paid by all operators to each individual in conformity with the terms of the agreement.

The above payment to individual mine workers, entitled to vacation shall be made at the option of the employing operator, except that in all cases full payment of the amount prescribed shall be made not later than the last pay day occurring in the month of June, 1943.

The vacation payment of the 1944 period shall be made on the last pay day occurring in the month of June of that year.

12. If the United Mine Workers make a wage agreement during the period of this supplemental agreement, covering wages or working conditions with any person, corporation, association or district, more favorable to the operators than as contained herein, then this supplemental agreement shall be modified so that the operators who are parties hereto shall receive all of the benefits of such more favorable agreement.

For the duration of this supplemental agreement no strikes shall be called or maintained hereunder.

13. The operators agree that they will not lease any operating mines subject to this supplemental agreement as a subterfuge for the purpose of avoiding the provisions of this supplemental agreement.

14. There shall be paid to each employee on the pay roll of the employer from April 1, 1943 to June 30, 1943, as his distributive share of and in full of, all amounts due for portal to portal since April 1, 1943, the sum of forty (\$40) dollars payable in equal installments during the four months commencing on the first day of the calendar month following the effective date of this supplemental agreement. Any employee on the payroll during said period for a time less than the full said period shall be paid a corresponding pro rata share of such forty (\$40) dollars.

15. The payments herein provided for shall be construed to be in full settlement and discharge of all portal to portal compensation accruing prior to April 1, 1945, and in settlement and discharge of all pending litigation by the mine workers against the operators and by the operators against the mine workers signatory hereto for such portal to portal compensation. In consideration of such acceptance and discharge the operators and mine workers signatory hereto agree that all actions at law and suits in equity heretofore instituted by them involving the question of portal to portal compensation shall be dismissed. This paragraph shall be without prejudice to any right of any party signatory to this supplemental agreement arising after April 1, 1945.

16. This supplemental agreement, as to general wage rates, may, on thirty (30) days' notice from either party, be reopened for negotiation at the end of the first contract year (March 31, 1944). The foregoing sentence shall not preclude the parties from mutually agreeing at any time during the term of this supplemental agreement, on changes in general wage rates, subject to such approval by the appropriate governmental agencies as may

be required by the Act of Congress of Oct. 2, 1942, and the executive orders and regulations issued thereunder. Furthermore, if at any time during the term of this supplemental agreement a significant change occurs in the government wage policy, either party shall have the right to request negotiations on general wage rates.

17. This supplemental agreement is an integrated instrument and its respective provisions are interdependent and shall be in effect only after the approval hereof by the appropriate governmental agencies and after the granting by the Office of Price Administration of advances in maximum prices sufficient to cover the increased costs occasioned hereby.

18. All signatories to this agreement shall assemble in joint meeting in Washington, D. C., on March 1, 1945, to negotiate a new agreement.

(Editors' note: Appendix, not reproduced, followed the instructions for computing payments issued Nov. 20, 1943, by the Coal Mines Administration).

4,000 Join Drive On Waste of Fuel

Secretary of the Interior Ickes announced Dec. 10 that almost 4,000 engineers had volunteered their services in the Bureau of Mines fuel efficiency program for the conservation of coal, coke, wood, petroleum and gas as part of the government's critical resources conservation campaign.

Dr. R. R. Sayers, director, Bureau of Mines, announced appointment of four coordinators to direct the work of regional engineers under the National Fuel Efficiency Council. They were Melvin P. Hatcher, director, Kansas City Water Department, for Kansas City, Mo.; Henry F. Hebley, director of research, Pittsburgh Coal Co., for Pittsburgh; J. H. Herron, president, James H. Herron Engineering Co., for Cleveland, and H. K. Kugel, chief engineer, smoke regulation and boiler inspection, District of Columbia.

The campaign will be directed at first toward industrial and commercial plants as the largest users of fuel and hence the ones with the greatest opportunity for economies in its use. Fuel-efficiency information of the Bureau of Mines will be made available to cooperating companies.

Bootlegging Continues

Bootleg mining operations in the Pennsylvania anthracite fields were continuing last month despite the ban on such activity which went into effect Nov. 30. Governor Martin of Pennsylvania conferred with officials of the Independent Miners, Truckers and Breakermen's Association of Schuylkill, Northumberland and Columbia counties, but told them there was nothing he could do about the situation. Clyde Machamer, president of the association, said earlier that the bootleggers were determined to continue in their efforts to try to negotiate leases for coal lands. Floyd Chalfant, Pennsylvania Secretary of Commerce, said it was up to the owners of the land to prosecute.

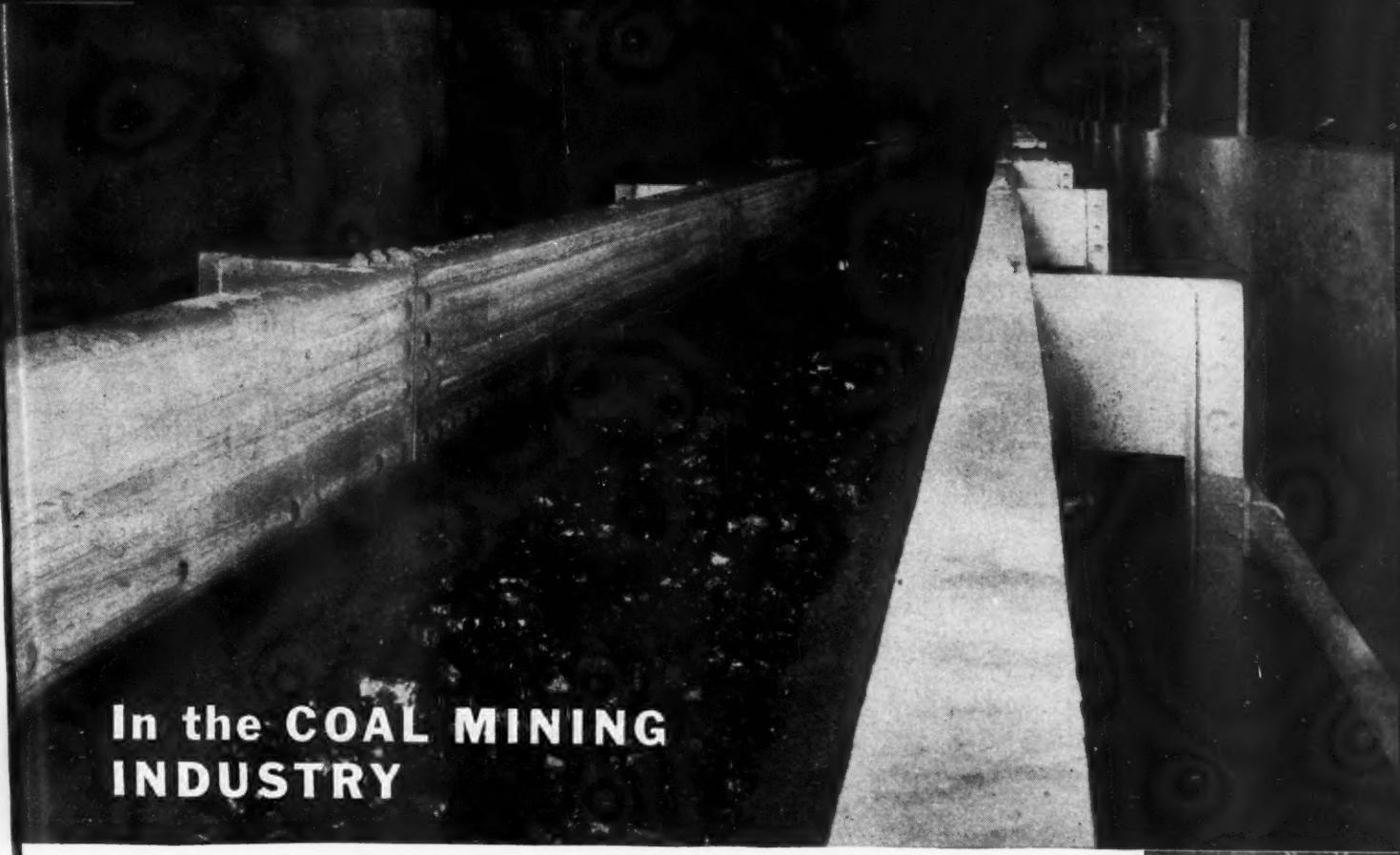
Mason Presides Over Smoke-Eaters

Assuming the presidency of the National Mine Rescue Association, Pittsburgh, Dec. 8, H. E. Mason, superintendent, Leisenring No. 1 mine, made a stirring address. "In this dry season," he declared, "the stage is now being set for one or many mine explosions. We have heard tonight about four or five recent tragedies. Next year we shall hear about as many more unless you men do something about it." It was the twentieth birthday of the association which had its first meeting 19 years ago at Leisenring No. 1, with this same Mr. Mason as host on the occasion.

Others unanimously elected were J. J. Rutledge, mining engineer, State of Maryland, as vice president, and J. W. Pero, safety engineer, Pocahontas Fuel Co., as secretary-treasurer. Cooperation of mine-rescue men in the work of civilian defense in 22 out of 48 States was announced by J. V. Berry, supervisor of safety engineering, Industrial Collieries Co. This committee was then discharged with thanks. Recounting his trip to England to obtain first-hand information on their methods of recovering men and bodies after raids on industrial cities and to visit "hot spots" where such incidents were still occurring every night, Lieut. Col. S. H. Ash, Head, Rescue Service Section, U. S. Office of Civilian Defense, asserted that events might so shape themselves that the Civilian Defense organization might be made a permanent institution to function after explosions and floods, as the technique of recovery called for men with expert knowledge of the manner in which tunneling through debris could best be performed.

Tells of Mine Fire

An address made by E. E. Queenon, mining engineer, U. S. Bureau of Mines, described the fighting of a fire at No. 15 mine, Purglode Coal Co., Purglode, W. Va. This resulted from a shortcircuit between the trolley wire and a mine locomotive. Apparently, when the fire occurred at 2:55 a. m., the section foreman failed to order the men to leave the mine. He died in attempting to perform his duties. In all, 13 died of whom 12 were suffocated, the thirteenth was never found. There were nine openings and many opportunities to escape but from lack of knowledge of the mine and a natural tendency to leave by the accustomed route, the twelve men perished. A man instructed to tell them of the best method of exit failed to do so and left a notice in chalk to guide the men, but this was so placed that they doubtless did not see it. The mine operates the Pittsburgh seam (84 in. thick) and the Sewickley 90 ft. above it and is rated gassy, producing over 1,395,000 cu. ft. of methane daily. It was rockdusted and at that time was ventilated by two fans. There are now three. Electrical operation is effected at 250 and 550 volts, with the pumps using 440 volts. Descriptions of the Sayreton No. 2 explosions and the explosion at the Three Points mine were given by G. W. Grove, Chief, Mineral Production Securities Division, U. S. Bureau of Mines.



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AL AGE



Pittsburgh Airs War and Post-War Issues

Increased Powder Charges Approved—Fischer-Tropsch Process Better Than Hydrogenation—State Rescue Teams in Two Commonwealths—British Use Our Loading Machines—How to Boost Coal Output—Shuttle Cars

PLACE OF mechanization and hydrogenation in the future, State programs for training and equipping mine-rescue men, causes for failure of coal production to meet the nation's demand and shuttle-car operation were outstanding features in the program of the 57th annual meeting of the Coal Mining Institute of America, Pittsburgh, Pa., Dec. 9-10, but perhaps the declaration of W. Garfield Thomas, Deputy Secretary of Mines of Pennsylvania, that experiments have shown that the charge limit of permissibles can be raised safely from $1\frac{1}{2}$ to 3 lb., or even more, will appear the paramount development, though J. E. Tiffany, chief, explosives division, U. S. Bureau of Mines, was not ready to report.

CONSERVING MAN POWER—Industry is killing 100,000 men annually and 9,000,000 men suffer from lesser accidents, declared Thomas Moses, national chairman, Committee for Conservation of Man Power in the Coal Mining Industry. No wonder a collection was made from industrial establishments to foster a drive to reduce these appalling figures and to save for the war effort the services of these men. The drive, which is sponsored by the National Safety Council, was for \$5,000,000, of which \$2,500,000 was collected. Having set up in the N.S.C. a separate organization for coal mining and having established an accord with the United Mine Workers, the Committee expected to inaugurate through the State mine inspectorates a drive to reduce drastically the 13,000 fatalities and 50,000 injuries that annually befall the workers in the coal-mining industry. The purpose is not to supersede others' efforts but to correlate and so intensify them.

PROJECTED EFFORTS—Richard Maize, Pennsylvania's Secretary of Mines, stated that the bituminous mine inspectors who met Dec. 8 had been directed to undertake this mission and would get into operation early in January. J. J. Walsh, Deputy Secretary of Mines, will organize the State inspectors in the anthracite region. For Jesse Redyard, chief, Department of Mines, State of West Virginia, Joseph Bicer, State mine inspector, declared that the campaign would start early in the present month.

OIL SHORTAGES—Need for oil, asserted Dr. A. W. Gauger, school of mineral industries, Pennsylvania State College, will require, under present consumption trends, the discovery of 50 to 60 billion barrels in the next 20 years to maintain present ratios of reserves to consumption—as much as has been found since the oil industry was started, 80 years ago. Yet it now requires three times as much drilling per barrel of oil as it did five years back.

Probability of finding large fields is decreasing, though demands for motor fuel and lubricants steadily increase. It is true new designs might double mileage per

gallon, for the efficiency of the automobile engine is only a fraction of what it should be. After the war, it may be assumed $1\frac{1}{2}$ billion barrels annually will be used. Only about 13 years' supply of oil is on hand.

WAY OF COMBATING SHORTAGE—Means of meeting the liquid-fuels shortage are: (1) distillation of oil shale, (2) use of replaceable raw material such as agricultural products, (3) improved efficiencies in utilization, (4) use of solid fuels in internal combustion engines and (5) liquefaction of coal. Winchester has estimated,

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Vice Presidents—J. M. Connor, general superintendent, West Penn Power Co.'s Coal Mines, Pittsburgh, Pa.; G. W. Grove, chief, Mineral Production Securities Division, U. S. Bureau of Mines, Washington, D. C.; C. A. McDowell, director of industrial relations, Vesta Coal Co., California, Pa.

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said Dr. Gauger, that there are slightly over 92 billion barrels of recoverable oil in the oil shales of this country. Limited experiments have shown that the cost of distillation of these shales will be from \$1.75 to \$2 per barrel. Dr. A. E. Dunstan, chief chemist of the Anglo-Iranian Oil Co., London, operating the Scottish oil-shale industry, states that shales may be more suitable sources of diesel oil than of gasoline.

At present petroleum prices, alcohols or other combustibles from agricultural materials are hardly feasible, but chemurgy is still in its infancy. As the present efficiency of the motor-vehicle engine is only 15 to 30 percent, development may improve that performance and thus save fuel. Liquid fuels are produced from coal by (1) carbonization, (2) Bergiusization (direct hydrogenation), (3) synthesis from water gas by the Fischer-Tropsch process and (4) a combination of solution and hydrogenation.

GOOD GASOLINE, POOR DIESEL OIL FROM HYDROGENATION—The major product of the Bergius type of hydrogenation is gasoline which has an octane number of 70 to 75 and such a high lead susceptibility that it may be raised to an octane number of 90 to 95. By blending certain fractions of the products, some reasonably good Diesel oil, having a cetane number of 52, may be obtained by hydrogenation, but most of the oil produced by this process and boiling in the diesel-oil range is of poor quality with cetane numbers between 20 and 40. No satisfactory lubricating oils are known to have been made by this process.

ONE TON IN ALMOST FIVE—Yield of liquid products by the Bergius-type process is said to be between 60 and 65 percent by weight of coal treated, and total coal consumption for all purposes including coal actually converted is about $4\frac{1}{2}$ tons per ton of gasoline produced. Latest information indicates that, in the most recent type of plant, about 190 to 200 gal. of gasoline is yielded per ton of dry ash-free coal.

At present, about 20 commercial plants are treating bituminous coal, brown coal, lignite and crude tar oils by the Bergius process. German production of gasoline by this means is reliably reported as about 31 million barrels per year. The British have a plant of commercial size with a capacity of about 1,000,000 bbl. per year; this usually operates on a bituminous coal of quality similar to that from the Pittsburgh bed near Pittsburgh, but at present the plant is operating primarily on high- and low-temperature coal tars, so as to increase output of gasoline for war purposes.

FISCHER-TROPSCH TYPE PROCESS—In this process water gas made from coal or coke is converted into a gas composed mainly of two parts of hydrogen to one part of carbon monoxide. The gas must be

HOW TO TEST MINE LOADER LUBRICANTS



1 WHEN should you test new mine loader lubricants?

WOULD YOU like a dollar for every time you've been asked to try somebody's mine loader lubricant? You've had good reasons for not testing some of them. There is,



... don't nail the door on all tests

however, one reason for not closing the door on all tests.

New Lubricant Developments

The perfect mine loader lubricant has not yet been made. Any reputable manufacturer is continually endeavoring to improve his product. New ingredients and new manufacturing methods are continually being developed. Improvements have been made in the past; there will be more in the future. Your interest in improved



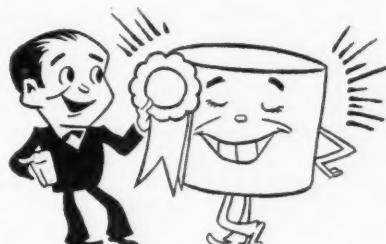
... new ingredients discovered

loader maintenance and operation is reason enough for keeping the door open to tests of these new products as they are offered.

This does not mean that every grease or oil brought to your doorstep should be taken in. When a lubricant is offered for test, ask these questions:

1. Has it been service tested? Although the lubricant may be newly developed, most reputable manufacturers will have records of the product's performance in the field under actual service conditions. A study of these records will help you determine whether you should test the new product.

2. Is your equipment to be a "guinea pig"? Frequently a lubricant manufacturer is looking for an opportunity to make these service tests on a newly developed product. Where tests are requested on that basis, your first consideration is to assure yourself that the product has been carefully developed and thoroughly proved in the laboratory. The reliability of the manufacturer is of first importance here.



... not awarding blue ribbons

3. What will you gain by these tests? The reason for making any test is, of course, not to pin blue ribbons on any particular lubricant, but to improve the operation of your equipment. Even though service records or laboratory tests of the lubricant indicate that it will reduce consumption or maintenance, or improve equipment life, a test is the only way to determine whether it will give you these advantages.

Oil is Ammunition . . . Use it Wisely

4. Will the lubricant manufacturer help in the test? You can be guided in your decision to make a test by the importance the manufacturer places on his request. Will a competent representative of the company analyze your operating conditions with you, and recommend the proper type and grade of lubricant? Has this representative definite suggestions on procedure to be followed, if you want them? Although the tests may result in considerable economy of operation to you, the lubricant manufacturer will also reap some benefit. His interest and willingness to cooperate should help you decide for or against a test.

When you have decided to make a test, it is to your own interest that it be thorough, and as fair and impartial as possible. Suggestions for making such a test will be described in this space next month. Or, if you would like the complete story now, send for the folder—"How To Test Mine Loader Lubricants." Pin the coupon to your letterhead, or paste it on a postcard. Send it to Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 5, Illinois. In Nebraska, address Standard Oil Company of Nebraska at Omaha 2.

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freed from sulphur compounds, after which it is passed over suitable catalysts, usually nickel or cobalt, finely divided, and substantially at atmospheric pressure and at a temperature around 180 to 210 deg. C. The reaction emits much heat, so the reaction chamber must be suitably cooled.

POOR GASOLINE, GOOD DIESEL OIL—This process produces directly a low quality of gasoline; its octane number is less than 65, and it has a low lead susceptibility. However, the gasoline fraction can be cracked and re-formed to produce satisfactory anti-knock products. The diesel oil fraction is of high grade and is reported to have a cetane number as high as 100 to 120. Because of this, the material is generally used for blending, as cetane numbers of 50 to 60 are usually satisfactory. In current operation, it is reported that the liquid products yield on refining 62 percent gasoline, 26 percent diesel oil, 10 percent gas, and 2 percent paraffin wax.

According to present information, about 7.5 lb. of liquid products, or 1.2 gal., are obtained per thousand cubic feet of gas treated. The theoretical yield is 13 lb. per thousand cubic feet. Using the Fischer-Pichler Process (a modification that uses different catalysts and higher pressures), a yield of about 9.4 lb. per thousand cubic feet has been reported. Assuming that the water-gas is produced from coke and the extra hydrogen obtained from the carbon monoxide of the water-gas by the carbon monoxide-steam reaction, these figures indicate a theoretical yield of liquid products of about 110 gal. per ton of coke treated and an actual yield, using the Fischer-Tropsch process, of about 63 gal. per ton of coke treated. These figures include only the coal converted to gas and do not include coal used for the production of process steam or power.

As of 1938 Germany was reported to have 14 plants making synthetic gasoline by the Fischer-Tropsch synthesis, the combined capacity of which was slightly over 7,000,000 bbl. One plant using the Fischer-Pichler process was in operation and had a capacity of 175,000 bbl. per year. Japan is believed to have two plants of this type in operation with a capacity of 215,000 bbl. per year. Several additional plants were planned, but it is not known whether they have been constructed.

EXTRACTION-HYDROGENATION PROCESSES—By extracting coal with certain solvents, such as tetralin, phenols and various coal-tar fractions, in the presence of hydrogen, it can be converted into soluble material. The yields of extracts can be considerably increased by regulating the temperature so as to exceed the boiling point of the solvent but not the decomposition temperature of the coal. As extraction proceeds, the decomposition temperature of what coal remains increases, and it is thus possible progressively to increase the temperature of extraction until all extractable material is recovered. The temperature of extraction is reported to range between 300 and 450 deg. C., and sufficient hydrogen is introduced to maintain the hydrogen content of the solvent. This is known as the Pott-Broche process.

CAN HYDROGENATE PRODUCT—The sol-

uble coal may then be hydrogenated by a process which is essentially the same as the second liquid-phase stage of the Bérgius hydrogenation process. Little information is available as to the quality of the products thus obtained, but it is believed that the liquid-phase hydrogenation products are subjected to a further hydrogenation-cracking to produce high-octane gasoline. The advantage of this process and of the Uhde process, which is somewhat similar, is that instead of coal liquefaction in the first stage by high-pressure hydrogenation, which converts about 60 to 65 percent of the coal, the first stage of the extraction hydrogenation process yields about 80 percent conversion and is conducted under relatively mild conditions of temperature and pressure. In 1938, three plants were operating in Germany using the Pott-Broche process and having a reported capacity of a little over 350,000 lb. per year; one plant using the Uhde process was believed to be in operation and had a capacity of 70,000 bbl. per year. No figures are available on the costs of making liquid products by the Pott-Broche process.

COST OF GASOLINE PER GALLON*

	Cents
Berginization product	22.6
Fischer-Tropsch product from coal	19.2
Fischer-Tropsch product from natural gas	8.8†
High-pressure hydrogenation of petroleum	5.5
Refinery, oil \$1.20 per barrel	5.3
Refinery, oil \$2.00 per barrel	8.5

Just now, concluded Dr. Gauger, it is better to use coal for stokers than for hydrogenation and other forms of liquid fuels. Dr. H. H. Storch, principal physical chemist, Central Experiment Station, U. S. B. M., agreed that hydrogenation will prove costly both in coal and in steel used for construction of hydrogenation equipment. The indirect Fischer-Tropsch process has an excellent chance to compete with petroleum and may consume some coal. Though he knew nothing from his own experiments about the process, he knew the oil men regarded the Fischer-Tropsch process as promising. In further comment, Dr. Gauger remarked that the State College stoker gave much better than the conventional stoker efficiency. Whether it would save fuel was questionable, for the average owner of a stoker kept a higher house temperature than the owner of a hand-fired furnace and so used more coal.

Speaking again for Mr. Redyard, Mr. Bierer, describing the State rescue stations in West Virginia, said that 15 to 20 hr. of training is merely a good starter for a rescue man. Only experience and hours of further training will make a really competent man. A mine should have an organized crew of five or six apparatus men backed by one or more reserve crews. Frequently, eight or more crews are present at a disaster.

The system started with seven stations, but there are 25 rescue stations now. Each

* Dr. A. C. Fieldner's testimony before the O'Mahoney Committee, Aug., 1943.

† Natural gas at 5c. per 1,000 cu.ft.

has 6 oxygen breathing apparatus, 6 all-service gas masks, 1 inhalator, 1 carbon-monoxide detector and other accessory material. There are seven men connected with each station. They practice 2 hr. twice each month. The men get \$4 per month and the captains \$5. There are also eight rescue trucks in the State. The 23 mine inspectors are each appointed to one or more stations. They are required to be present whenever men are being trained.

OHIO'S RESCUE STATIONS—The Ohio General Code, declared Marcus Kerr, chief, Ohio Division of Mines, provides for maintenance of four fully equipped rescue stations and any number of rescue teams that the superintendent of mine rescue may deem advisable subject to the approval of the chief of the division. Without experience to guide its decision, the division has provided three teams for each station, each recruited from a single mine, so that training periods will not be in conflict. The men are paid by the State and receive \$5 a month, the captain being paid \$6. Hours of training are designated by the chief.

In emergencies, payment of the men is at the rate set by law with compensation under the provisions of the State's own industrial insurance. Heretofore, in Ohio (as Mr. Kerr believed is customary also in many States) rescue teams are composed of volunteers and consequently are really not covered by compensation except through recourse to the courts, but these men when thus employed are all State employees, subject to the division's orders, paid and insured by the State.

EQUIPMENT PROVIDED—These rescue stations center around a specially designed motor truck carrying six oxygen breathing apparatus, a pump, oxygen storage cylinders, a resuscitating unit, ten gas masks, five safety lamps, two monoxide detectors, a methane detector, cap lamps, charging equipment, etc., 500 ft. of 2-in. hose with nozzles and enough parts and supplies for maintaining the equipment. A qualified assistant superintendent of mine rescue, on full-time employment, at each station takes care of the equipment and supervises the teams, passing on the qualifications of the men. All the men must pass a physical examination prescribed by the superintendent of mine rescue and made by a doctor paid by the State.

Of 177 trained in 1941 by the State and 75 others certificated because of training by the Bureau of Mines, only 50 men are still available, the rest having largely gone, it is believed, to other industries rather than to the armed forces. The State is not the loser, said Mr. Kerr, for these men are providing for the safe conduct of other State industries. Should not the State have a rescue establishment for all industries similar to the emergency squads of the larger cities, cooperating with the division of mines, the State fire marshal, division of elevators and division of factory and workshops.

In the bituminous mines of the State of Pennsylvania, said D. C. Jones, superintendent, coal-mining extension, Pennsylvania State College, there are 50 or 60 rescue crews. The H. C. Frick Coke Co., added Clyde Lutton, safety director, has

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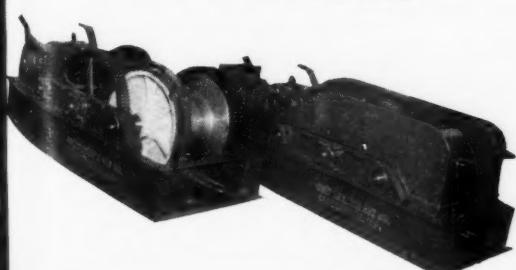


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10 teams. In the anthracite region, there are about 250 rescuers, asserted R. D. Currie, district engineer, General Re-Insurance Corp. Twelve trained teams are located in the mountain area around Barnesboro, added Dennis Keenan, State mine inspector, and according to G. W. Grundy, mine foreman, the Rochester & Pittsburgh Coal Co. has 10 trained teams.

There are about as many company teams in West Virginia as State teams, said Mr. Bierer. When a man who is in State employ is injured while engaged in rescue work, he is covered by his State compensation, no matter in what mine he is injured. Men who assist are considered to be working for the company in whose mines they are doing rescue work. When in Pennsylvania a man, acting as a rescuer, is killed or injured in performance of his duty his accident is charged as a count against the company which has the disaster and not against the company in whose mine he is a regular employee.

At the banquet, J. D. A. Morrow, president, Joy Manufacturing Co., told 600 diners that manufacturers of loading and other machines, although unable to fill present orders because of the demand for war implements, are looking ahead and planning on the basis of world-wide developments.

"In India and other countries, the long-held belief that good machinery could be made only in England is being dispelled. They see our tanks, airplanes and other products in action, and their confidence is being won. In England, too, the mine union leaders are sold on mechanization, partly because it means the end of tonnage rates and that only hourly wages will be paid."

At one mine where the coal was 8 ft. thick and production was only 1.4 tons per man-shift, the manager, a canny Scot, asked how the output desired was to be obtained. He was shown the Fairmont system of mining. "That," said he, "is nothing but the stoup-and-pillar method, we discarded 45 years ago. We should never have done so." However, added Mr. Morrow, there are places in Great Britain where longwall is essential.

"We should be awake also," he continued, "to our opportunities at home, where a tremendous output of coal is indicated, with a much wider spread between mechanized production costs and selling prices. After the war, no mine is going to live long unless it is mechanized. Labor and management relations will improve because those miners who are employed then will have better jobs. Better safety conditions will be established. Coal producers will be regarded then as the leaders they really are, having already shown the way to improved methods in the mining of bauxite, potash, magnesium, copper and other minerals.

LOSS OF MANPOWER—From December, 1941, to November, 1942, when all the Appalachian mines were working on a 35-hr. week, 521 men in the mines of the company left for the armed forces and elsewhere, declared James L. Hamilton, assistant manager, Northern Coal Mines, Republic Steel Co. During the month of November, 1942, these mines produced 96,346 tons less than in December, 1941.

In December, 1942, an agreement, negotiated with the United Mine Workers of America, permitted employees to work six days per week with time and one-half for the sixth day worked within the work week. The employee had to work Monday through Saturday, inclusive, to be entitled to overtime pay for Saturday's work. This agreement materially increased output, but did not offset all the tonnage lost by the reduction in manpower. Further, continued reduction in personnel due to the requirements of the armed forces began immediately to reduce the tonnage that had been gained by operating an extra day.

To maintain daily production on the highest level possible, those employees who desired extra shifts each day were given that opportunity. For this, overtime had to be paid after the first seven hours of each workday. These longer hours, however, did not compensate for new inductions into the service, enlistments, etc.

ABSENTEEISM NULLIFIED LONGER Hours—Absenteeism reaching 15 percent has been an important factor in nullifying

EQUIPMENT APPROVALS

Three approvals of permissible equipment were issued by the U. S. Bureau of Mines during November as follows:

Joy Mfg. Co.—Type 14BU-3 PMF loading machine; one 4-hp. and four 7½-hp. motors, 500 volts, d.c.; Approval 458A, Nov. 18.

Goodman Mfg. Co.—Types G and GS-15 shaker conveyors; 15- or 20-hp. motor, 220, 440 and 550 volts a.c.; Approvals 491 and 491A, Nov. 20.

Goodman Mfg. Co.—Types G and GS-12½ shaker conveyors; 10-hp. motor, 220 and 440 volts, a.c.; Approvals 492 and 492A; Nov. 20.

efforts to increase production. Wherever union representatives have shown a willingness to participate, labor-management committees have been set up at mines. Though these committees have discussed ways and means of increasing production and reducing absenteeism, and several helpful suggestions have been received from them, which have aided the drive for production, to date no suggestions from union committee members have aided in the drive to reduce absenteeism.

EXPIRY OF LABOR CONTRACT—Prior to the expiry of the Appalachian Agreement, Mar. 31, operators and union representatives spent months trying to negotiate a new agreement, but portal-to-portal, or travel, pay presented such a series of conflicting issues that the negotiations were not concluded Nov. 3, at which time Secretary of the Interior Ickes and John L. Lewis, president, United Mine Workers, entered into an agreement, calling for a 9-hr. portal-to-portal day.

So long as these lengthy negotiations continued, the mine workers worked indifferently; this fact and the many strikes during that period greatly reduced output.

Since the Ickes-Lewis agreement was signed Nov. 3, practically all the mines, at least in the Appalachian area, have been working on what is known as an 8-hr. day and 40-hr. week contract and this, according to Government estimates, has caused a material increase in coal production throughout the area. A committee of operators are now meeting daily with representatives of the United Mine Workers, and it is assumed that in the near future an agreement will be negotiated between the operator-union representatives which will be within the framework of this agreement, which will undoubtedly relieve the mine workers' minds, and thus increase tonnage, at least in those mines where travel time does not exceed 45 min. daily.

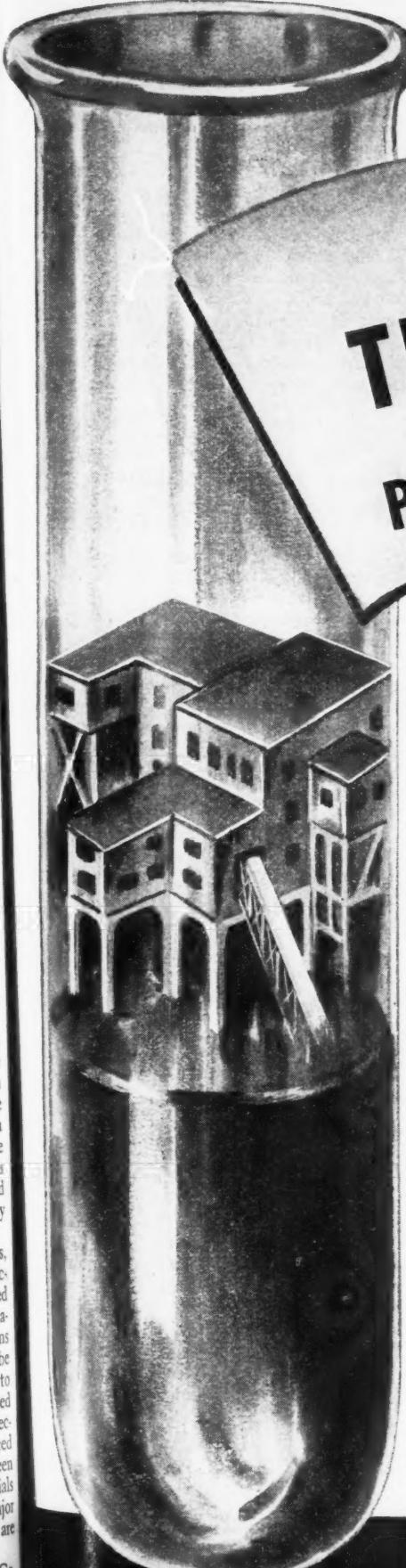
GETTING-TO-WORK PROBLEMS—Shortages of gasoline and tires have caused employees to leave the Republic's mines to procure work closer to their homes. About a year ago, transportation committees were formed at each of the mines, greatly relieving transportation difficulties. These committees have enabled the men to get enough gasoline and tires to travel to and from work, but have not completely stopped men from leaving for work nearer their homes.

During the latter part of 1942 and the early part of 1943, the Republic Steel Co. increased its mechanical coal-loading equipment. Though this added to the daily output, it did not meet production estimates because persons of ages between 18 to 30 years operate more efficiently than older men. These young men were being inducted into the armed forces, and accordingly the machinery had to be operated by older and slower men.

LACK OF MECHANICS—Further, the armed forces withdrew from the mines mechanics vitally needed to keep equipment in operating condition, and before new men could be trained, production from the then operating machines was reduced. To overcome this shortage, mechanically inclined employees were trained to take the place of those drafted. The several companies whose equipment was in use were asked to send an instructor to the mines to train the new men. These men selected were taken to some part of the mine where, under the supervision of this factory representative, they disassembled and reassembled the equipment which they were expected to keep in repair.

TRAINING AT FACTORY—In other cases, the chief repairmen were sent to the factory where equipment was being purchased and spent several weeks watching the machines being assembled, asking questions and obtaining data that they felt would be needed in teaching their new duties to other employees—a measure that proved helpful. Inability to get repair parts, electric trailing cables, etc. has also reduced production, even though efforts have been made to anticipate needs and get materials on hand in ample time to avoid major breakdowns which occur when parts are used beyond their normal life.

At the mines of the Pittsburgh Coal Co. by new development and strip mining, declared Henry Rose, production manager, production has been kept almost on a level despite loss of men to the armed forces and to other industries. In 1944 an



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output of a million tons a month is expected. Labor in the mines consists of direct production work at the face and of service labor, including coal cleaning. Unless an effort is made to analyze conditions, when production decreases, service labor may not decrease proportionately.

Thus in January, 1942, the men at the face represented 61 percent of the employees and in January, 1943, the percentage had dwindled to 54. If a manager were anticipating the operation of a 2,500-ton mine, he would provide a certain service force, and when the mines are running he should be careful to see that, when his operation drops from 3,000 to 2,500 tons, the proportion suited for a 2,500-ton production is not exceeded.

To increase tonnage, the company has tried to get men back from the armed forces and has educated and trained its supervisors not so much by directives or teaching as by talking over problems with them. The endeavor has been to make the foreman a manager by giving him a free hand to use and act on his judgment after the problems have been discussed with him. He must know all about the company's policy and agreements.

To get more tonnage, working conditions must be improved and also social relations. The company should find out what is causing turnover. The Viscose Co. could not keep its men on its third shift. Having a smaller force, they had no coca cola salesmen for that period, and the men, disgusted at the discrimination, left the job. The slogan, "Ask the man who works here" is a good one to remember. A man with 5,000 workmen has 5,000 salesmen to "sell the company" or unsell it. Its public relations depend on their judgment of the company's policy.

The men also should have proper incentives. With the passing of day labor, the valuable incentive of pay graded according to production has been lost. Whatever these incentives are they should be such that the men can understand them and calculate them themselves. Men should be trained at the face. They should not learn from one another or "by catch as catch can." Demonstrators from the factory don't always show the best and safest way. Preferential methods should be determined before bad methods crystallize into bad habits.

Health, said A. J. Williams, local chief, Office of Price Administration, is essential for success and there will be 25 percent less food in 1944 than in 1943. When men are working as hard as miners, 2 lb. of meat a week is insufficient. Great Britain has introduced differential rationing, and it may be necessary to introduce it here despite its inconveniences. One concern prepared four kinds of sandwiches for the men entering the mines. Of these, any man could purchase all he needed, and one man took in sixteen with him.

Unlimited rations are given to corporations to supply food to their workmen on the job. However, in discussing the matter with miners, they said, "What we want is wages, not sandwiches." At one shipyards at noon, the men went to a cafeteria where food was served by the chef of the Duquesne Club. The salads were dressed up to be attractive and had thick meat

between their bread covers. Nine dietitians were employed.

Some of the troubles of the coal operators are due to men getting statements of availability to which they are not entitled, said P. T. Fagan, area director, War Manpower Commission. Only a man having a higher skill than he is exercising can be regarded as available for a war industry; for instance, if a miner is a machinist or welder, he will be regarded as eligible for a war-factory position. Also, he may be available if he has no repairs for his car or the distance he has to travel is excessive. He becomes in the available class if he has been without a job for 60 days or more. But, it seems certain that many men to get in a war factory are declaring falsely that they are not mine workers.

Miners, said M. D. Cooper, superintendent, Hillman Coal & Coke Co., often work irregularly to keep out of the upper brackets in the income tax. A definite understanding of the incidence of the tax would in many cases convince the workmen that it is foolish to lose real money to avoid a remote possibility. To those who find men idle for lack of pacs and rubber shoes, Mr. Williams said that the War Transportation Committee at the mine had power to give orders for these necessities to miners needing them.

When shuttle cars are first introduced, enthusiastic and capable men are chosen to put the first unit in operation, but later the less desirable men have to be accepted and production losses, personal injuries and even mine disasters occur, said E. F. Miller, assistant division superintendent, Koppers Coal Division, Eastern Gas and Fuel Associates. With shuttle cars, more room is needed between posts because the positioning of the cars can never be as exact as with cars running on rails.

Rubber tires do not cut cables as readily as wheels running on steel rails, but internal breaks occur which are the more undesirable because they do not show on the surface. When brake bands and drums on shuttle cars get wet, they often fail to stop the cars. When also the floor is wet, skidding is likely to occur. Four-wheel steering is removing much of this danger, however.

As the ratchet post-puller is too slow, the tendency is to use the shuttle car to pull out mine props. Then the driver of the car is likely to watch the action of the rope and the fall of the post. In so doing, he cannot see where he is going and gets into serious trouble. Power prop pullers should be provided.

Problems presented where coal is thin, shuttle cars are small, drivers must stoop, clay floor forms potholes, and gradients are adverse were described by Samuel Law, assistant chief engineer, Red Lands Coal Co. (see Foremen's Forum, p. 72 of this issue).

Drills, cutting machines, loading equipment and haulage units should be studied to ascertain if they are team mates, declared J. W. Woomer, consulting mining engineer, Wheeling, W. Va. in an address on "Industrial Engineering's Place in Coal Mining." Why use a cutting machine that can cut eight places per shift when the loading machine can load only five cuts, due possibly to the size of the mine cars?

said Mr. Woomer. Why cannot all men at a mine enjoy incentive payments over their guaranteed daily wage so that all employees will participate in cost reduction? Some coal companies already are doing it.

Quoting Charles Steinmetz, R. E. Charlier, industrial relations manager, Pittsburgh Coal Co., said "Cooperation is not a sentiment; it is an economic necessity," and added, "We want to overcome the easy method of writing trite sayings about cooperation with no intention of doing anything about it. Instead of constantly watching for misdeeds to pounce upon and use as reasons for splitting good relations wide open, such misdeeds, if they do occur, should be brought to the attention of either guilty party in an attitude of helpfulness."

Coal 'Catastrophe' Is Feared by SFA

Unless the nation's coal stockpiles can be replenished next summer, the coal situation next fall, in the words of the Solid Fuels Administration for War, "will approach catastrophe."

In a release dealing with coal prospects for 1944, SFA said the United States entered the new year with a shortage of 25,000,000 tons of bituminous coal, taken from stockpiles. Stockpiles have been reduced from 86,000,000 tons at the beginning of 1943 to about 60,000,000 tons at the start of this year.

SFA said 1943 consumption would exceed an earlier estimate of 600,000,000 tons by about 5,000,000. Production, the office said, was about 580,000,000 tons of bituminous.

SFA made this summary of the situation:

"The coal shortage is acute now and most factors point to an increasing deficit next year."

Increased demands for Europe were cited as part of the reason for depleted stocks here.

Secretary Ickes said 620,000,000 tons of bituminous will be required for this year, and added that if all estimated 415,000 miners work every available production day at a rate of 5.2 tons of coal per day, they would still produce only 604,240,000 tons. Manpower losses by the mines were placed at from 2,600 to 2,800 a month, and at 75,000 since the start of the war. Breakdowns in machinery were also blamed for some of the situation, the SFA said.

Ickes estimated the nation started the year with less than a month's backlog in stockpiles.

Dr. Sayers Honored

Dr. R. R. Sayers, director, Bureau of Mines, has been designated by President Roosevelt to serve, when so directed by the Secretary of the Interior, as undersecretary of the Interior or first assistant secretary during their absence or illness.

The designation was carried in an executive order signed at the White House Dec. 7.

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HEAVY-DUTY CONSTRUCTION EQUIPMENT

Safety, Mining and Cleaning Debated

Safe Methods and Equipment, Coal Cleaning, Maintenance of Electrical Equipment and Cables, Strip Mining Among Kentucky Institute Subjects

KENTUCKY is to have a mine foreman's guide. At its annual meeting, Dec. 10 and 11 at Lexington, the Kentucky Mining Institute voted to have a committee appointed to compile and publish the guide, financed with institute funds. It is planned to sell copies of the guide. Appropriations for the Department of Mines & Minerals have not been sufficient to render this service and for several years Kentucky mining men have been begging copies of the West Virginia guide, which, however, in some of its answers does not fit Kentucky mining laws.

Papers and addresses delivered at the meeting included three on safety, two on maintenance, one on strip mining, one on coal cleaning and one on manpower. Grounding of face equipment, possibilities of using three-wire d.c. power, insulated couplings for powder cars and proper placing of detonators in charges provoked lively discussions.

Paul M. Jones, engineer, Jones & Donan, Madisonville, was elected president. E. F. Wright, general superintendent, Southern Mining Co., Insull, and retiring president, piloted the meeting. Mr. Jones presided at one of the sessions and at another G. M. Humble, chief engineer, Stearns Coal & Lumber Co., was in the chair. Louis W. Huber, Mine Safety Appliances Co., was chairman of the program committee.



Some of the speakers and chairmen at the Lexington meeting. Left to right, back row: A. D. Sisk, Paul M. Jones, G. M. Patterson, Louis W. Huber; front row: Lloyd G. Fitzgerald, George C. Barnes Jr., E. F. Wright Jr., C. W. Denham.

Low-temperature distillation of Kentucky coals is due soon for an investigation through study and experimental research, according to a report given at the

dinner Saturday by C. S. Crouse, head, Department of Mining & Metallurgical Engineering, Kentucky University. "Because coal is our principal source of carbon," said Prof. Crouse, "I think it is indefensible to burn coal raw." At the university an \$18,000 building to house the equipment is almost completed. The legislature is being asked for \$35,000 to carry on the installation and work during the next biennium. The first appropriation, that for the biennium now closing, was \$15,000. William R. Sutherland, professor of English, was toastmaster. W. H. Tomlinson, engineer in charge, U. S. Bureau of Mines, Norton, Va., described the organization and aims of the National Mine Rescue Association organized in 1930 to take over the original "Smoke Eaters."

Proper voltage served to the machines was put first by G. C. Barnes, senior engineer, West Virginia Engineering Co., in a talk on maintenance of electrical equipment during war time. Other steps recommended were: eliminate abusive treatment, keep electrical parts clean, test insulation resistance regularly, restore resistance by varnishing or other means, proper lubrication which with anti-friction bearing motors means principally "do not over-lubricate"; use relays to best advantage in giving equipment full protection and systematize maintenance with emphasis on prevention of trouble rather than on repairing.

This policy of planned maintenance, according to Mr. Barnes, is dictated by three essentials: (1) coal production must be maintained to supply arms and trans-

KENTUCKY OFFICERS

President—PAUL M. JONES, engineer, Jones & Donan, Madisonville, Ky.

Vice-presidents—C. B. JACKSON, general superintendent, Blue Diamond Coal Co., Big Stone Gap, Va.; GEORGE M. HUMBLE, chief engineer, Stearns Coal & Lumber Co., Stearns; V. D. PICKLESIMER, superintendent, South-East Coal Co., Seco.

Secretary-treasurer — A. D. SISK, safety director, Big Sandy-Elkhorn Coal Operators' Association, Pikeville, Ky.

Directors — E. F. WRIGHT, Jr., superintendent, Southern Mining Co., Insull; E. R. PRICE, general superintendent, Inland Steel Co., Wheelwright; L. C. SKEEN, general manager, Eastern Coal Corporation, Stone; O. W. EVANS, general manager, N. & W. Ry. Fuel Department, Wil-

liamson, W. Va.; HARRY LA-VIERS, general manager, South-East Coal Co., Paintsville; M. H. FORESTER, vice-president, Consolidation Coal Co., Jenkins; C. PREWITT GUM, general manager, Wisconsin Coal Corp., Wiscoal; FRANK M. MEDARIS, general manager, Harvey Coal Corp., Harveyton; L. P. JOHNSON, general manager, Crummies Creek Coal Co., Crummies; B. W. WHITFIELD, JR., Harlan Collieries Co., Brookside; BRADLEY SPARKS, vice-president and general manager, Luzerne-Graham Mining Co., Greenville; BRENT HART, president, Hart Coal Corp., Mortons Gap; C. S. CROUSE, head, Department of Mining & Metallurgical Engineering, University of Kentucky, Lexington; G. M. PATTERSON, chief mine inspector, Dept. of Mines & Minerals, Lexington.

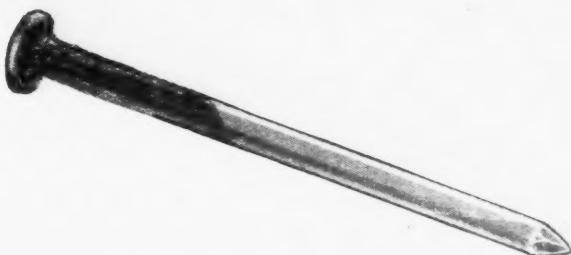
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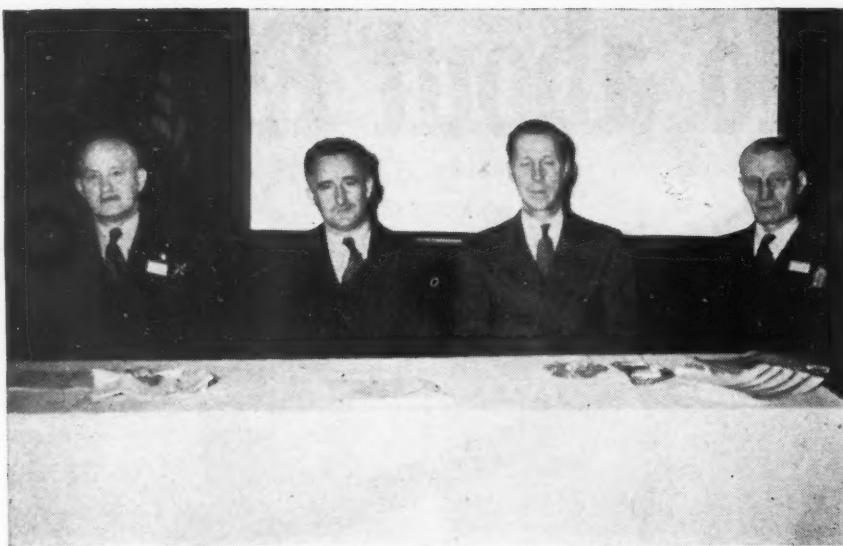
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New officers of the Kentucky Mining Institute. Left to right: A. D. Sisk, secretary-treasurer; Paul M. Jones, president; V. D. Picklesimer, third vice-president; George M. Humble, second vice-president. C. B. Jackson, first vice-president was not present.

portation, (2) many of the materials used in building mining machinery and in making repairs are scarce, (3) manpower for making repairs is a critical factor. He cited the case of a mine where locomotive armature failures have tripled during the last two years, apparently due to the accumulative effects of harder work and less time and men for handling maintenance.

On the subject of voltage at the face he said that every available piece of copper trolley wire and feeder should be put into use. As a next step he told of the possibility of changing from a 275-volt two-wire system to a 275-550-volt three-wire system to obtain a further voltage improvement without buying new copper. This is the system which he described in *Coal Age*, July, 6, 1945. For decreasing the instances of severe damage to face electrical equipment by insulation breakdowns and with a possibility of giving safer operation, he proposed the advantage of not solidly grounding the frames of equipment such as mining machines and loading machines that rest on the bottom of the mine. (*Coal Age*, December, p. 73.)

Kentucky Fatalities Cited

G. M. Patterson, chief, Department of Mines & Minerals, mentioned three recent fatalities in Kentucky on hand-held drills and it was as a result of his observation and question that Mr. Barnes specifically stated that hand-held drills are an exception and should always have their frames solidly grounded for safety. Robert D. Blake, maintenance foreman, Consolidation Coal Co., Jenkins, pointing out that voltages as low as 40 can force enough current through a man's body to be fatal, said he believed the frames of cutting machines and other face equipment should be grounded solidly by a third conductor.

G. W. McCormick, district mine inspector, Madisonville, asked Mr. Barnes if elimination or lack of grounding would cause stray currents to fire detonators prematurely. The answer was, "No, if the leads were kept properly shorted." Indic-

ative of the unusual things that can happen, however, Mr. Barnes told of a Pike County case of premature firing apparently while the leads were still shorted and caused by lightning striking a large oak tree standing directly above the place being shot and where the mine cover was 40 ft.

Mr. Patterson read a brief paper outlining the facts and drawing conclusions regarding a fire, recent disasters and gas ignitions in eastern Kentucky. At four mines in eastern Kentucky, gas has been discovered recently for the first time in dangerous quantities and Mr. Patterson emphasized that no bituminous mine is free from the danger of explosive gas. He said that power switches to non-working sections should be pulled, locked and the bypass circuits to pumps be properly fused and protected. Two ignitions were caused by attempts to relight flame safety lamps with matches, indicating an astonishing ignorance or disregard for rules.

"Records of the Bureau of Mines," said Lloyd G. Fitzgerald, with the Bureau at Mt. Hope, W. Va., "show that 14 coal-mine explosions occurred from Jan. 1 to June 1, 1943. Explosives were involved in four of these explosions. Black powder caused two of the accidents and permissible explosives used in a non-permissible manner, the other two. These statistics are mentioned to show that explosives are still causing severe accidents." He set forth safe practices for storage and transportation loading and firing of permissible explosives. Some time was devoted also to "the permissible blasting device Cardox," for, in the writer's words, "This device is not actually an explosive but is used in blasting coal and has caused enough accidents to merit discussion in this paper."

He mentioned that the principal danger, that of the flying shell in hard coal where the holes are placed improperly, was practically eliminated by one company by use of a sprag pipe inserted into a bore-hole drilled 30 in. and intersecting the

regular borehole at an angle of about 30 deg. That coal company cooperated with the bureau in testing the spragging method under extreme conditions of holes drilled into the solid and with the discharge caps of the shells cut off. Some failures showed up under these extreme conditions. Mr. Fitzgerald said that when Cardox is being fired everyone should be 100 ft. or more away and where possible have two or more corners between the firer and the shot.

In charging a borehole with permissible explosive, the position of the detonator as recommended in the paper proved of considerable interest as indicated by a number of questions asked the speaker. The recommendation was: "The primer should be made with the electric cap secured centrally in the cartridge and pointing toward the bulk of the explosive in the cartridge. The primer cartridge should be the last placed in the hole, with the detonator pointing toward the bulk of the charge and the bottom of the hole."

Another recommendation of the paper came in for a lot of discussion: "An insulated coupling should be used if the explosives trip is pulled by an electric locomotive, and an empty car should intervene between the locomotive and explosives trip."

Cooperation of the operators, preferably through the operators' association if there is one, was the first of a number of recommendations given by C. H. Denham, civil and mining engineer, Harlan, Ky., in his paper "Maintaining Interest in Coal Mining Institutes."

Good Officers an Essential

Drawing from experiences with the Harlan institute, he outlined other methods of building and holding interest: Good officers including a paid secretary of tact, ability and resourcefulness; a large part of the membership appointed on committees, suitable places for meetings where men can sit down in comfort; programs started on time and officers not tardy; after-dinner programs not more than one hour long; safety as the main theme; a Delineascope available for projecting illustrations; collect 25 cents a head at each meeting and draw for a war bond; occasional games such as bingo; a ladies' night once a year; a safety magazine which includes programs for future meetings; mining schools, and safety meets.

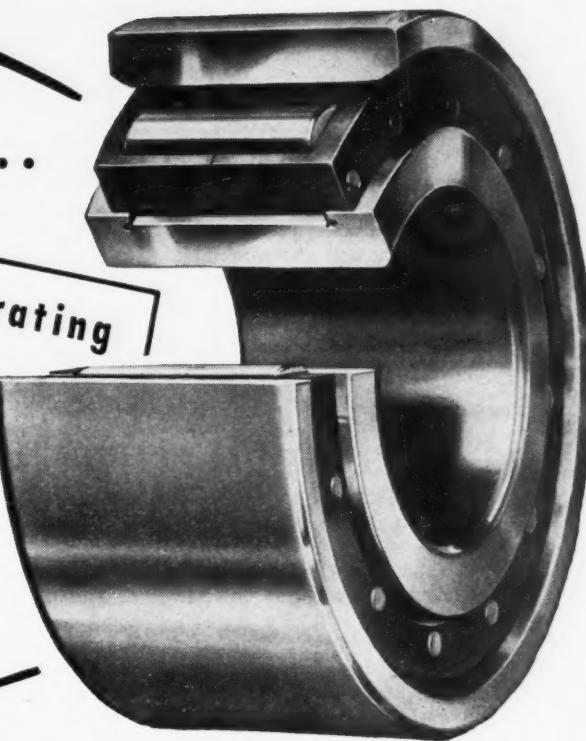
From nothing in 1930, strip-mine production has increased to 23 million tons per year in western Kentucky, said Paul M. Jones. Stripping there had its real beginning in 1920 when the Sunlight Coal Co. opened. By 1925 seven mines were in operation but by 1930 not one operation was left.

The Sentry Coal Mining Co., opened in 1937, signaled the rebirth of the strip industry and it was the first to be completely drilled, prospected and planned before opening. It is in the No. 14 seam, 84 in. thick, uncovered by shovels and drag lines. Haulage is by 15- to 35-ton semi-trailers and the preparation plant has McNally-Norton wash boxes. (*Coal Age*, p. 55, May, 1938; p. 90, Aug., 1941, and p. 47, Nov., 1941.) Both horizontal and vertical drilling is done in shooting the overburden and the explosive is 30-per-

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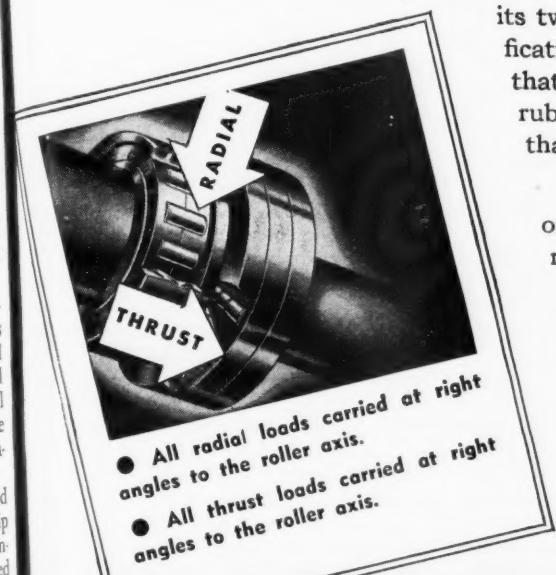
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BEARINGS

cent gelatin dynamite. The average shooting cost is 3¢ per cubic yard.

Mr. Jones also described in some detail a new operation of the Stirling Coal Co. at Daniel Boone which has two draglines, one having a 3-*yd.* bucket and the other a 2½-*yd.* By Jan. 1 this company was to have had a new preparation plant in use. The newest strip mine is that of the Mau-ger Mining Co., associated with the Mau-ger Construction Co. It started production last July 15, loaded 26,000 tons in the first two weeks and 50,000 tons in the next month. The present opening is in the No. 11 seam but both the No. 11 and No. 12 seams will be worked under parts of the property. Mr. Jones' paper included a description of all of the important seams in stripping in western Kentucky. The No. 9 seam supplies 75 per cent of the region's strip mine output.

For conserving trailing cables of cutters, loaders and locomotives for reasons of material shortages and safety, Robert D. Blake, maintenance foreman, Consolidation Coal Co., Jenkins said, the first step should be treating new cables with due respect. Cable reels should be maintained in good condition. On loaders and shuttle cars without reels the cables should be kept out of the way so they won't be run over. Nips should be properly fused to protect the cable and/or suitable sectioning circuit breakers used.

He recommended as good practice keeping as much cable off the reel as possible and hanging the nip as far back on the trolley as feasible and still reach the face. Specifying cable of proper insulation and of large enough conductor capacity to prevent overheating and to deliver a practical voltage to the face is very important. With those precautions and by keeping the cable free of oil, trailing cables will give long life, Mr. Blake said. He mentioned seeing cables still good after being used 1 to 2 years on locomotives and after 3 years on mining machines.

For splicing, which was the scheduled theme of his paper, he recommended Newberry type sleeves and friction tape for temporary splices made at the face and for permanent splices, conductors joined with copper sleeves tightened by a velocity power press and vulcanized rubber jackets. He thought 50 per cent of the old cable could be saved by splicing and vulcanizing and that it was practical to reclaim any piece over 15 ft. long although some bring the limit down to 5 ft. As to the number of temporary splices to be allowed before changing cables and rebuilding, he suggested 12 in a 300-ft. locomotive cable and 6 in a 300-ft. two-conductor or three-conductor cable. V. D. Picklesimer, general superintendent, South-East Coal Co., thought two temporary splices the limit in a trailing cable.

Davis Read, production manager, West Kentucky Coal Co., read a paper written by F. R. Buckley, chief engineer, describing the mobile loader, shuttle car and conveyor mine and the preparation plant at the company's North Diamond operation. The layout of this 100 percent belt haulage mine in the No. 11 seam 70 ft. below the surface and of the preparation plant which utilized the tipple of the old North Diamond shaft mine in the No. 9 seam,

were described in *Coal Age*, p. 40, July, 1941. Since then the shaker and chain conveyors have been replaced by six Joy loaders each served by two shuttle cars which discharge directly onto 30-in. belts.

All but two of the shuttle cars are cable-reel type operating but 300 ft. in rooms. The other two are battery type used on development and operating a maximum of 800 ft. Six loader units with their shuttle cars average about 400 tons per shift in this 6-ft. No. 11 seam. In the cleaning plant (5,000 tons per day) the air tables which had been used to clean the 4x0-in. were taken out in favor of a hydro-separator installation now being completed to handle all of the carbon up to 100 tons per hour. The original Menzies hydro-separator for the larger sizes is continued in use.

The paper detailed the study and pilot plant work done on the No. 9 and No. 11 coals preliminary to opening the slope mine and building the washer. The latter runs two 8-hour shifts and is operated by three maintenance men on each of those shifts. The regular maintenance crew of five men comes on a half hour before stopping the washer and stays a half hour after the washer is started on the next shift. This gives them a chance to see it working and talk with the operators. Refuse disposal by contractors using motor trucks costs 7 to 8¢ per ton but has the advantage of flexibility.

Talks On Equipment

Ralph Mulligan, National Coal Association, speaking on procurement and priorities, said his information points to 1944 as being the year of greatest war material requirements despite the fact that many programs have been cut back. He implied that coal operators contemplating new equipment should not delay placing orders on the premise that the demand for coal will drop or the prices of equipment will fall. "I think we have a lot of coal to produce in 1944 and '45 and there will be no lower prices," he said.

Because underground machinery to go to the United Kingdom represents only about 15 percent of new production and will be spread over the four quarters, the mines of this country should be able to get most of what has been ordered. As for strip mines, they will hardly be affected by the United Kingdom order because that will be filled principally by second-hand equipment, mostly from war construction jobs.

In the summary of his paper on "Use and Misuse of Flame Safety Lamps in Coal Mining," W. H. Tomlinson, district engineer, U. S. Bureau of Mines, Norton, Va., made the following suggestions for ending accidents with the flame safety lamps as the direct cause or contributing factor: (1) Use only U. S. Bureau approved flame safety lamps; (2) see that the men are specially trained to handle them; (3) clean all lamps after each use; (4) trust a lamp only after it has been demonstrated in an explosive mixture; (5) all lamps used in a mine should be the property of the operator so he has full control over them; (6) eyesight of men using the lamps should be examined and corrected; (7) before making tests always check the

height of the fuel cap; (8) upon an indication of gas, remove the lamp promptly but not suddenly; (9) fence off the dangerous section; (10) if the gas accumulation is large, attempt the removal only on the off shift; (11) have at every mine at least two approved lamps and at least two persons skilled in their use; (12) prohibit smoking underground and ban smoking materials.

"A flame safety lamp," said Mr. Tomlinson, "should be the safest of all devices, but, sad to relate, it isn't." He pointed out that scores of explosions have been caused by defective or mis-used lamps. Carrying of non-approved type should be absolutely prohibited, but even so, the safety that should be afforded depends on competence and reliability of the men maintaining and using the lamps.

Three men drilling a 175-ft. horizontal exploratory hole (2½ in. in diameter) at the face of a heading in three hours and doing it with a No. 473 Chicago-Pneumatic electric coal drill was a maximum performance related by W. W. Cox, chief engineer, Black Mountain Coal Corporation, Kenvir, in his paper, "Approaching and Cutting Into Old Works or Abandoned Headings." Drill rod 1 in. in diameter was used and the cuttings were flushed by water carried to the auger by a ½-in. pipe lying in the hole with the drill rod. As a guide for the drill rod during the first 20 ft. or so of hole, a 2-in. pipe 10 ft. long and with its end about 2 ft. from the face is set on timbers. The auger itself is of usual length, therefore the ½-in. water pipe extends to within a few feet of the end of the hole.

Fernie Colliery Nears Completion

Equipped for an annual production of more than 1,000,000 tons at a cost of more than \$1,250,000, the new Elk Colliery plant near Fernie, B. C., was reported early last month as nearing completion. The plant will be operated by Crows Nest Pass Coal Co., Ltd.

The colliery is located four miles from Fernie and its output is expected to exceed the aggregate of all five mines which the company at one time had in production. Its preparation plant is four stories, concrete base and red tile sides and extends over seven spur tracks. The frame is of structural steel, 104x98 ft. and 68 ft. high.

Ten seams outcrop on the hillside where the new plant is located and three of them will be mined. Before the recent strike, Seams 4 and 9 were being worked, with an output of 500 tons daily. No. 4 seam is 10 ft. thick and No. 9, higher up, from 10 to 14 ft. No. 10, still higher, is 20 ft. thick. Nos. 4 and 9 will be mined full depth and No. 10 to only half its thickness. The coal is said to be high in carbon content and will be shipped to plants in the United States just across the border and to Western Canada for industrial use.

A railway yard 1,500 feet long is being levelled and connects to a spur of the Coal Creek line. A quarter-mile of conveyor house connects the portals.

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**several cents per ton
lower maintenance
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Mining Questions Studied by A.M.C.

Coal Mining and Power Problems Analyzed in Coal Division Committee Reports—Dr. C. J. Potter Discusses Seizure and the Future in Coal

CLOSER WARTIME controls over coal distribution, a promise of help in the industry's manpower, equipment and price-ceiling problems and a prediction that maximum production will not be attained until the mines are operated by private owners under an industry-wide wage contract were contained in a talk given by Dr. Charles J. Potter, deputy solid fuels and coal mines administrator, at the annual conference of the coal division of the American Mining Congress, Hotel William Penn, Pittsburgh, Dec. 3. Dr. Potter's talk closed the one-day session, featuring reports of coal division committees on developments in power, haulage roads, roof action, mechanical loading, conveyor mining, ventilation and surface preparation.

Reviewing the events leading up to the second seizure of the nation's mines by the government and explaining government's function under the order, Dr. Potter pointed out that bituminous production had reached 12,700,000 tons, highest in the past 16 years, for the first full week under the Ickes-Lewis wage agreement.

"In connection with this, Secretary Ickes stated publicly that the sudden and comparatively large increase in production strongly bore out his frequent assertion that a contract with the miners would remove one of the major obstacles which have blocked full production. But I think we all well know that we must have a still higher rate of output and maintain it over a long period of time if we are to get our coal supply back on a satisfactory basis again.

"The government is extremely desirous of terminating its possession and control of the mines at the earliest possible date. Even under the best possible circumstances it would be difficult, if not impossible, to realize under government possession the full efficiency of production that the mines might attain under private management with normal operating conditions and an industry-wide wage contract."

Dr. Potter said that operators representing three-fourths of the nation's tonnage had agreed to discuss a wage contract, within the terms of the government agreement, with the miners. He said the government was hopeful that those efforts "would bear quick fruits and speed the day when the mines can be returned to private management."

A firm denial that anyone in the Coal Mines Administration, including Secretary Ickes, sought nationalization of the industry was entered by Dr. Potter. He quoted public statements of the Secretary denying such reports, and added: "I can assure you unqualifiedly that every member of the Coal Mines Administration's staff shares the Secretary's desire to return the mines as soon as possible." He also

stated that it was the plan of the Administration to consult with operators' committees during government operation of the properties.

The 1944 requirements for bituminous Dr. Potter placed at 620,000,000 and anthracite at an estimated 66,000,000 tons. "To meet these requirements," he said, "will require the utmost effort and cooperation by every man in the coal producing industry, both mine worker and mine management."

Predicting that war requirements will necessitate closer controls over distribution, Dr. Potter nevertheless made a plea to the industry to help avoid coupon rationing. "I think we are all aware," he said, "of the difficulties which more rigid distribution controls would place in the way of attaining full production."

Dr. Potter revealed that the Secretary of the Interior has already taken steps to halt the drain on coal mining manpower and to build up the industry's requirements, which he placed at 56,000 new men for 1944. A full time officer of SFA has been assigned to the problem. The War Manpower Commission has been enlisted in a drive to hasten return of former miners now in other industry to coal and a general recruiting campaign has been undertaken by the United States Employment Service to get former miners back into the industry and enlist physically qualified men without experience.

Moses Is Toastmaster

SFA has also obtained a higher preference rating for coal mining equipment, and Dr. Potter urged operators to make their requirements known to the War Production Board as soon as possible. He was introduced by Thomas Moses, father of Harry Moses, president of the H. C. Frick Coke Co., who was detained in Washington. Mr. Moses also introduced George E. Stringfellow, vice-president, Thomas A. Edison, Inc., West Orange, N. J., who made an appeal for the preservation of private enterprise.

In an informal question and answer period after his speech, Dr. Potter revealed that mines reporting to him had found that miners were obeying the terms of the government contract calling for 84 hours of production time, but, he added, if any mine finds they are not obeying the terms, it should be reported to SFA for appropriate action. He also said that he believed the Coal Mines Administration would have no alternative save to operate for the duration mines which did not reach a contract with the miners.

The morning and afternoon sessions were given over to reports of the coal division committees, with Secretary Julian D. Conover opening the meeting and turning it over for the reports to Glenn Southward of the Congress staff.

C. C. Ballard, New River Co., Mount Hope, W. Va., chairman of the Committee on Underground Power, introduced Donald J. Baker, I. T. E. Circuit Breaker Co., Philadelphia, whose recommendations for changes in the color code system for mine cables was adopted by the meeting. R. A. Gray, Rome Cable Corp., gave a report on splicing of mine cable with synthetic materials and asserted that equipment is available for vulcanizing with synthetic materials in the field. He said he foresaw no real difficulty in splicing with synthetic materials but warned that a period of experimentation must precede most effective results. D. E. Renshaw, Westinghouse Electric & Manufacturing Co., East Pittsburgh, said his sub-committee would have a report ready shortly on borehole and underground cables.

Warning the conference that it must get ready to absorb men with a great deal of Army training after the war, Otis D. Stewart, Electro-Metallurgical Co., Alloy, W. Va., talked on a.c. voltage distribution underground. The first requirement, he said, was protection and added that more startling developments in power distribution can be expected after this war than occurred after the last one. "We are going to have tomorrow," he said, "what we consider impossible today, and we must get ready for it."

Reporting for the Committee on Haulage Roads in place of R. V. Clay, chairman, C. C. Hagenbuch, mining engineer, Hanna Coal Co., St. Clairsville, Ohio, said that some of the standards of 5 to 10 years ago must be revised because of the increased speed of locomotive haulage and the progress of mechanical mining. J. B. Haskell, West Virginia Rail Co., Huntington, W. Va., also stated it was imperative that standard changes be made to meet new conditions.

Facts gathered from a survey of a Western Pennsylvania experience in sealing mine roofs with bituminous compounds to prevent deterioration occupied most of the report given by Frank G. Smith, general manager, Sunday Creek Coal Co., Columbus, Ohio, chairman of the Committee on Roof Action. Mr. Smith said the material had first been applied in February and had been carefully watched during the summer for reaction to high humidity. Deterioration developed, he said, but not to any appreciable extent and he concluded that "there is still a lot to be said for the treatment."

Dr. H. P. Greenwald, Bureau of Mines, Pittsburgh, Pa., also checking the experiment, said his tests had shown that falls at the mine were primarily due to the nature of the rock itself rather than to any failure of the coating material to protect it. His conclusion, he said, was that coating could not be proposed as a cure for roof troubles until the cause of the

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“There is nothing mysterious about our plan of operation. It is getting costs down through cooperation to reduce the number of accidents. It is building up an organization for service and seeing it gives the service.

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trouble itself had been determined. A geological map of the area is in preparation, Dr. A. J. W. Headlee of the West Virginia University Geological Survey, reported, in an effort to interpret the rock structure so that mining companies can help determine whether roofs are suitable for sealing and whether they will be benefited by it.

Following a luncheon meeting at which First Lieut. John L. Russell of the Army Air Force spoke on his experiences in North Africa, Sicily and Italy, S. M. Cassidy, manager, Weirton Coal Co., Weirton, W. Va., gave the report for the Committee on Mechanical Loading, which this year was devoted in large measure to maintenance and training. E. H. Johnson, Jeffrey Mfg. Co., expressed the opinion that the kind of job a mine gets done with mechanical loading depends more on the supervisory organization than on physical conditions. He said best management is obtained by direct line authority, and urged that everything possible be done to uphold the authority and prestige of foremen.

Pointing out that maintenance work almost always sooner or later involves a complete overhauling job, E. R. Cooper, general superintendent, Island Creek Coal Co., Holden, W. Va., urged consideration of the value of "unit" maintenance. Such a method, he said, eliminates the necessity for keeping a machine idle during a period of complete overhaul, but, he warned, it is most adaptable to mines which have a central repair shop and where equipment has been standardized. He said manufacturers should consider building mining machinery in units, and for small mines he suggested a group of them pooling together to maintain a central repair shop, possibly aided by the manufacturers.

Training generally has been divided into two classifications, said C. R. Nailler, production manager, Hanna Coal Co., St. Clairsville, Ohio, one where an entire course, from fundamental mathematics on up, is given, and the other where practical, on-the-job training is involved. The average mechanic, he said, wants to learn and advance quickly, so that the latter method proved more popular.

The work of the Committee on Conveyor Mining, said its chairman, T. F. McCarthy, general superintendent fuel division, New York Central R.R., had been centered on belt conveyors. E. H. Jenks, Rochester & Pittsburgh Coal Co., Indiana, Pa., and Neil Robinson, Robinson & Robinson, discussed loading from shuttle cars onto belts, indicating that a report would soon be ready. E. W. Beard, United States Rubber Co., led a discussion on the use of synthetic rubbers in belt conveyors. It was his opinion that synthetics would prove as satisfactory as crude rubber, but he admitted they were still in an experimental state and no positive predictions could be made. He said one neoprene belt had been in use 6 or 7 years. His over-all conclusion was that possibly an even better belt would develop from synthetic rubber experiments than had been possible with crude rubber.

Loading onto conveyors and the use of 20-ton mine cars was predicted for the future by E. B. Gellatly, Jeffrey Mfg. Co.,

who urged the operators to suggest some way to move conveyors. Once that has been done, he said, manufacturers would be ready to supply the machinery.

The compilation of a simple handbook on mine ventilation for supervisory employees will be the major project next year for the Committee on Ventilation, Walter E. Housman, mining engineer, H. C. Frick Coke Co., revealed. The committee is engaged on a study of the effect of sprinkling at the face to reduce mine dust, George M. Riggs, Weirton Coal Co., Isabella, Pa., said, and has set up a special committee on the control of coal dust with D. H. Davis, Pittsburgh Coal Co., as its chairman. Mr. Davis said the committee would go into the matter of costs against effectiveness of method.

Savings of coal to be derived from salvage from refuse piles and mine rock occupied most of the report of the Committee on Surface Preparation presented by T. W. Guy, Charleston, W. Va., consulting engineer. The committee also was studying the use of substitutes in surface preparation for restricted materials. George F. Osler, George S. Baton Co., Pittsburgh, said his company had found it profitable to attempt to recover coal from refuse and revealed that from 350 to 400 tons had been reclaimed for 1,800 tons of clean coal in a day's run at one mine. His company, he said, had obtained 100 tons a day of coal with less than 10 per cent ash by cleaning refuse.

Recovery of 200 tons a day of marketable coal with from 9 to 13 per cent ash was recounted by William S. McAleer, McNally-Pittsburg Mfg. Corp., who added that the practice may simplify underground mining by permitting full seam operations. E. B. Winning, Republic Steel Corp., Uniontown, Pa., said as much as 600 tons of coal with 11½ to 12 per cent ash was being recovered at one of his company's mines on two shifts for use as steam fuel.

Bureau of Mines Says Mixture Works

Mixtures of anthracite barley and bituminous slack coal may be burned in underfeed stoker equipment with approximately the same efficiency as straight bituminous, Dr. R. R. Sayers, director, Bureau of Mines, announced last month following preliminary tests conducted by the bureau in cooperation with Anthracite Industries, Inc.

Any increase in the amount of combustible material lost in ash and refuse usually is offset by better fuel bed conditions created by the anthracite, Dr. Sayers reported.

Solid Fuels Administrator Harold L. Ickes requested the study be undertaken in order to find new uses for barley.

Mixtures containing as much as 80 percent anthracite were satisfactory at one plant. Usually, however, it was found that the addition of 15 to 20 percent barley was sufficient to open up the fuel bed and lessen caking. Combustible material in the ash ranged from 18 percent to 35 percent, the latter in the 80 percent mixture.

Adams Honored For New Report

William W. Adams, supervising statistician, Bureau of Mines Economics and Statistics Service, was given an award of excellence on Dec. 4 by Secretary Ickes for helping to design a simplified accident report for coal and the federal and state governments.

The report simplifies the method of reporting accidents and, according to the Bureau of Mines, is saving thousands of man-hours for mining companies and also is making accident reports uniform. It is in use in states representing 85 per cent of the nation's coal tonnage, and was adopted as a result of an agreement among the Bureau of Mines, the National Coal Association and state mining officials. Previously coal-mining companies were forced to fill out two or more forms on the same accident. Now a single report with two or more carbon copies gives the same information.

Mr. Adams, a resident of Washington, D. C., will be recommended for an upward reclassification of his Civil Service grade.

Canadian Stripping

Seven new stripping mines in Alberta Province, Canada, started operations last month, according to W. J. Taylor, federal coal allocator at Calgary. Three of the mines are shipping coal by rail, with an output of 700 tons a day for the group. The others are shipping by truck. Two mines are located at Dodds, east of Camrose, one at Camrose, one at Taber, in southern Alberta, and one at Ayemore, near Brooks.

Removal of overburden is in progress on prairie land north of Taber on the Oldman River, 35 miles east of Lethbridge, Alta. Another stripping project is under way at Grassy Lake.

One of the Taber projects is being undertaken by Western Ventures, Ltd., a subsidiary of Osler, Hammond & Nanton, Winnipeg. The second project is in the hands of Majestic Mines, Ltd., president of which is C. B. Magrath, Chicago. Both projects are being supported by the Emergency Coal Production Board of Canada.

Dingus Honored

Ted Dingus, Seco, Ky., safety director, South East Coal Co., was awarded a silver trophy for outstanding safety work at the Nov. 26 meeting of the Big Sandy-Elkhorn Mining Institute at Pikeville, Ky. Announcement of the award was made at the September district meeting of the Institute but the award was delayed until the November session.

Rufus Bailey, Lexington, Ky., an official of the State Department of Mines, spoke on safety work. He described a recent fatal gas explosion in a Harlan County mine.

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Mining Now and Post-War Analyzed

Future Needs of Operators, Synthetic Fuels, Rubber, and Core-Drilling and Cementation Discussed by the Central Appalachian Section, A.I.M.E.



Friday speakers, chairmen and others—standing, left to right, Dr. H. H. Storch, Z. C. Waconer, Dr. H. C. Howard, Veleair C. Smith, C. B. Huntress; seated, L. I. Cothorn, George E. Keller, E. A. Munyan.

POST-WAR PROBLEMS in mining, core drilling and cementation, including the possibilities of bentonite muds for pre-grouting and spraying roofs; synthetic fuel processes and the relations of synthetic rubber and coal were subjects of the annual meeting of the Central Appalachian Section, American Institute of Mining and Metallurgical Engineers, Charleston, W. Va., Dec. 3-4. C. C. Dickinson, former president of the National Coal Association, was toastmaster at a dinner where Carroll B. Huntress, vice president, Republic Coal & Coke Co., New York City, and formerly N.C.A. secretary, spoke on "Private Enterprise and Freedom in the Post-War World." Harry Gandy Sr., Rapid City, S. D., another former N.C.A. secretary, was a guest at the dinner and spoke briefly. George E. Keller, manager, Commercial Testing & Engineering Co., Charleston, was elected chairman of the section for the coming year.

A number of things that coal operators of the future need was the concluding highspot of a paper on "Some Post-War Problems of the Mining Industry," by Dr. L. E. Young, consulting engineer, Pittsburgh. These included: complete co-operation of labor for efficiency and safety, better steels and alloys, machines to handle cuttings mechanically, devices to break down coal without blasting, permissible equipment and permission to operate it even while small quantities of gas are present but being cleared, combination cutting and loading machines, mobile drives for conveyors, duckbills moving across the face under their own power, all

loaders designed so they can load rock as well as coal, mining systems to get higher recovery with mechanical loading, shuttle cars practicable for gobbing materials, larger battery capacity per unit of weight, diesel mine locomotives, fireproof stoppings built cheaper than with brick, fireproof mine doors, better face illumination, power equipment for erecting crossbars (one unit is already in use and doing a job in central West Virginia), dependable communication with locomotive crews, alarms for gas, alarms for impending roof movement, storage bins between mines and preparation plants and raw-coal blending equipment.

Dr. Young discussed the need for a bookkeeping method in tax computation which will allow setting aside reserves for taking care of the development and maintenance which is being deferred because of the present rush for tonnage. The Interstate Commerce Commission recognizes that need for the railroads but the Internal Revenue Department will not allow it. Looking to the close of hostilities, he foresees a need to educate and give jobs to returning veterans and for the industry to try to get the best men.

While past progress, as he sees it, has been blocked by the attitude of labor leaders, by conservativeness or lack of imaginations on the part of some of the industry's own engineers and to some extent by the standardization that some mining companies have effected, he is optimistic because manufacturers are ready with new designs, because the Bureau of Mines is now permitted to start tests for permissibility of diesel mine locomotives, and

because of the courage that many mining men have shown in the past in trying revolutionary machines and methods.

Principal types of mining equipments and methods also were discussed by Dr. Young, who emphasized the need for more selective mining, which he defined as leaving the waste material underground rather than mixing it with the coal and then separating it on the outside. For very thick seams with a thick parting or for mining two seams separated by an interval of some feet, he thinks the upper seam or split in a room should be mined completely first, then the parting rock and lower seam handled in some manner resembling an outside stripping job.

For glimpses into the future, Dr. Young recommended the reading of the following articles which appeared in Coal Age's October, 1936, Quarter Century of progress Number: "A Quarter Century Before—and After," by Howard N. Eavenson, and "The Future: What Does 1936-61 Promise In Mine Developments?" by John A. Garcia. Encouraging, according to Dr. Young, is the large amount of research planned or under way. For a list, he referred to the tabulations which have been a regular feature of the recent February annual review issues of Coal Age.

In discussion, L. I. Cothorn, head, department of mining engineering, V.P.I., seconded the need for mobile conveyor drives. With the advent of suitable fire-

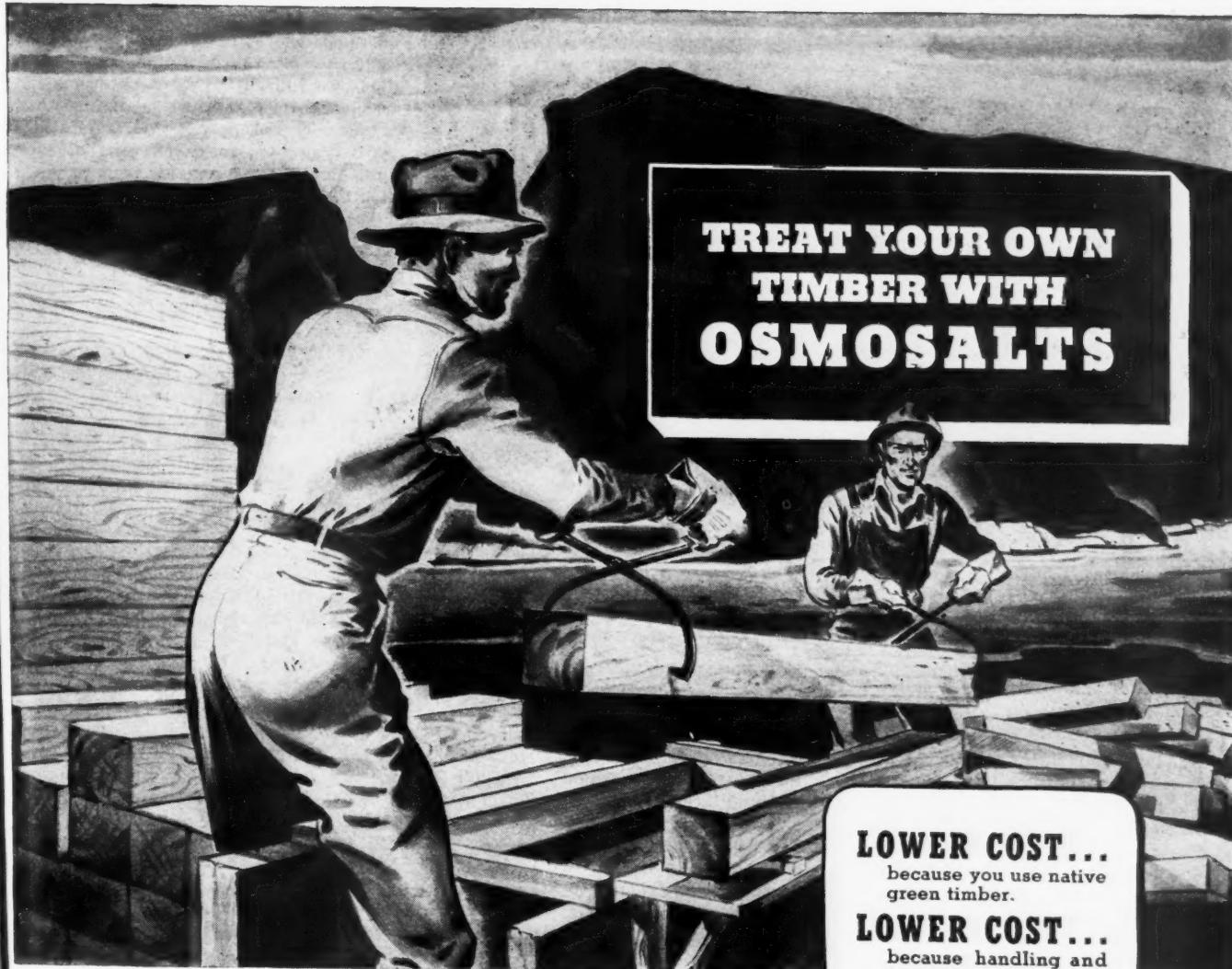
Executive Committee

George E. Keller, manager, Commercial Testing & Engineering Co., Charleston, W. Va., was elected new chairman of the Central Appalachian Section, A.I.M.E. Other officers and committee members were chosen as follows:

Vice chairmen—C. E. Lawall, president, West Virginia University; E. R. Price, superintendent, Inland Steel Co.; A. S. Shoffstall, general manager, International Nickel Co.

Secretary-treasurer—G. R. Spindler, assistant director of mining extension, West Virginia University.

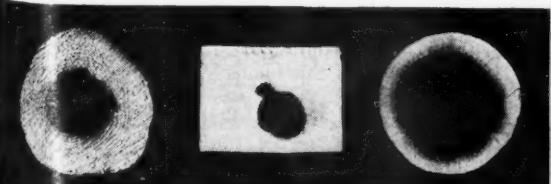
Members (in addition to the foregoing)—Herbert Husband, consulting engineer; D. P. Morton, chief rating commissioner, C. & O. Ry.; Fred K. Prosser, coal traffic manager, N. & W. Ry.; Julian E. Tobey, managing director, coal bureau, Upper Monongahela Valley Association; G. M. Patterson, chief, Kentucky Department of Mines and Minerals; and Veleair C. Smith, consulting engineer.



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Illustrated above are cross sections of three kinds of timbers. The white outer areas, which have been subjected to standard color reagent tests, show the deep penetration of the toxic salts in Osmoplastic.

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LOWER COST...

because you use native green timber.

LOWER COST...

because handling and transportation costs are greatly reduced.

LOWER COST...

because no special, expensive equipment is needed.

LOWER COST...

because it can be applied with any unskilled labor.

OSMOSALTS

Nature's Method of Wood Preservation

MANUFACTURED BY

OSMOSE WOOD PRESERVING COMPANY OF AMERICA, INC.

GENERAL OFFICES: BUFFALO 12, N. Y.

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Toastmaster, Saturday speakers and others—standing, left to right, C. C. Dickinson, R. H. Allen, W. H. Hampton, Dr. L. E. Young; seated, Carl Scholz, Veleair C. Smith and G. R. Spindler.

proof materials he sees the possibility of using line brattices in one entry instead of developing the typical entry of two or more headings. Disagreeing in a measure with Dr. Young, he felt that longwall mining may come into the future picture.

Carl Scholz, consulting engineer, Charleston, would add to Dr. Young's item on complete cooperation the need for cooperation between state inspection departments and the U.S. Bureau of Mines. He lamented the Bureau's application of one rule to a wide variety of mines. R. H. Morris, general manager, Gauley Mountain Coal Co., also put in a good word for the future of longwall and called attention to the possibilities of eliminating trolley wires and bonds if diesel locomotives go into the mines. Joining in the longwall discussion, J. H. Edwards, associate editor, Coal Age, said his observations, beginning in 1924, on true and modified longwall plans in this country point to their being fundamentally high-cost methods because in general successful roof control calls for a thin seam and enough parting and/or drawslate combined to "almost fill the gob." Otherwise excessive posting or cribbing is necessary. He expects longwall to come back when conditions warrant fuels of much higher cost.

Pre-grouting, according to W. H. Hampton, Hoffman Brothers Drilling Co., who read a paper on "Core Drilling & Cementation," is still being done in an unscientific manner although great savings are being effected through this method of cutting off the flow of water to rock through which a shaft is to be sunk. He contends that cores from the preliminary test holes should be studied and tested to determine porosity and all characteristics affecting reactions with cement. Based on experience with 19 pre-grouted shafts, all successful but one, if a test hole, bored in the center after grouting outside holes, takes cement, then the job is not successful.

Portal-to-portal pay, according to Mr.

Hampton, will bring about the construction of numerous shafts. In the southern coal fields, grouting pressures of 600 lb. per square inch usually are sufficient to block off water, but pumps are available for grouting up to 9,000 or 10,000 lb. Grouting of mine roofs to seal off water and add strength shows considerable promise, and for the underground horizontal drillings for this work the diesel-operated light-alloy steel drills promised after the war will be a great advantage.

R. H. Allen, Well Service Co., Charleston, followed with a paper on "Bentonite Muds." These, mixed with cement, are used regularly in oil and gas wells to shut off water and prevent caving. The bentonites are clays derived from deposits of volcanic ash and are of two classes: the swelling type, which will absorb five times the volume in water and swell to 15 times the original bulk, and the bleaching type, which absorbs little water. In well drilling, the muds also act as lubricants for the drill rods. Mr. Allen thinks bentonite could be used to advantage in core drilling and that when mixed with cement and applied with a spray gun it holds considerable possibility as a protector of mine roofs. He also emphasized the necessity of analyzing cores and determining the pH of the water before starting a pre-grouting job. Mr. Allen mentioned the new types of cement which have been developed for deep grouting and open fissures, including jell cements which, combined with fibered cements, will seal fissures of tremendous size.

B. H. Mott, president, Mott Core Drilling Co., which has been pre-grouting shafts for 15 years, concurred with Mr. Hampton in the importance of analyzing cores and determining the correct placing of holes. He said that not nearly as much cement is being pumped into holes as formerly because they are first surveyed with water pressure to pre-determine the amount of grout that will be taken or determine what measures must be taken to seal large fissures. He mentioned the pos-

sibilities of adopting the chemical or plastic grouts with which the oil and gas industries are experimenting. In a predetermined time, the plastic, pumped in as a liquid, sets to form a solid. Regarding retractable packers, Mr. Mott said these have been used for some years in core-drill grouting jobs and Mr. Scholz added that they were used in grouting the 550-ft. Glen Rogers (W. Va.) shaft sunk three years ago. The first hole, at the center, indicated a 1,500 g.p.m. influx of water and this hole took 5,175 bags of cement. Four other holes, 5 ft. from outside of the shaft, took bags of cement as follows: 538, 178, 117 and 58. When the sinking was completed the water influx was approximately 40 g.p.m.

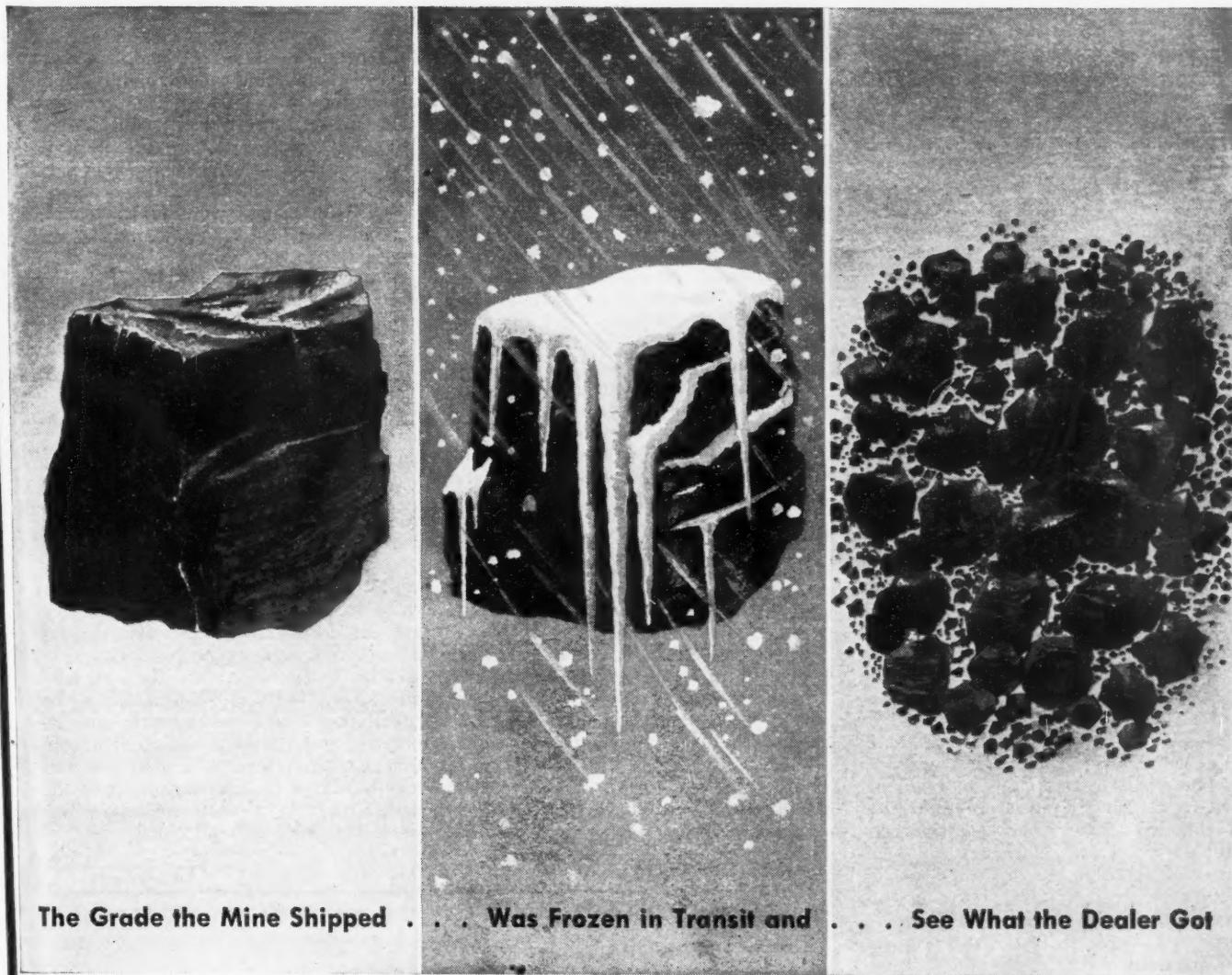
Veleair C. Smith elaborated on the properties of the bentonite muds and told of mines in Kentucky in which 5 percent of the roof is bentonite. The absorbing type can develop tremendous pressures. He thinks that guniting underground with bentonite cements may prove a practical means of controlling bad roofs. It is his opinion that this material will form a good bond with the roof materials as compared to sprays of gilsonite or asphalt paints, which he says do not form a bond with the stone.

That some authorities estimate that gasoline can be made at 7½c. per gallon by hydrogenation of coal by an improvement of the indirect Fischer-Tropsch method was brought out by Dr. H. H. Storch, U. S. Bureau of Mines, in his paper "Synthetic Fuel Processes," which he illustrated with lantern slides. Discussing that point, Mr. Smith said he has figures in the range of 5½ to 13 c. as the probable cost of making gasoline by hydrogenation.

After listing the known resources of fuels of this country in equivalent billions of tons of coal at 13,000 B.t.u. per pound and stating that the inferior crude oil derived from shales would cost \$2 to \$2.50 per barrel, Dr. Storch described the two main processes now being used by England, Germany and Japan to produce synthetic gasolines. By the direct, or Bergius-I. G., process, Germany is probably now making 4,000,000 tons of gasoline per year from brown coals and tar. Japan is thought to be doing little in making gasoline from coal but in 1935 England subsidized a plant making 150,000 tons of gasoline per year from coal by this Bergius-I. G. process. About 50 percent of the coal must be used for steam and power to operate the plant and then about 52 percent of the carbon in the remaining cleaned coal appears in the gasoline.

In 1937, the U. S. Bureau of Mines began tests with a Bergius process pilot plant taking 100 lb. of coal per day, from which the gasoline yield is 5 to 7 gal. Yields have been determined on 14 coals from various parts of the country. Pittsburgh coals yield about 130 gal. per ton and lignites 60 to 65 gal. In commercial plants using some of the coal for power the 130-gal. yield would net but 70 and the 60-65-gal. yield only 35 gal.

It is probable that in 1943 Germany, in seven plants, made 1,100,000 tons of gasoline from coal by the indirect Fischer-Tropsch method whereby gas is first made



The Grade the Mine Shipped . . . Was Frozen in Transit and . . . See What the Dealer Got

Maintain Grades—Freezeproof with Calcium Chloride

When a dealer orders lump, or egg or stove grades, you can imagine his disgust at getting a high percentage of slack. That's what happens when coal is so solidly frozen in the car that pick and shovel are needed to get it out.

The situation when dealers grab for every car they can get, regardless of quality, is not going to last forever. The most intelligent postwar

planning the mines can undertake is to do everything possible to maintain quality.

Coal freezeproofed at the mines with calcium chloride saves labor and equipment and does not have to be mined out of the car. Our Bulletin No. 37 tells how. Ask for it. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.



FREEZEPROOF COAL AT THE MINES WITH

CALCIUM CHLORIDE

from the coal. Japan is making about 500,000 tons of gasoline per year by that process. Both the United States and England have done much work on catalysts for improving the process and it is conjectured that as used in Germany and rushed into production by the needs of the war the process is not highly developed.

Dr. Storch thinks that we are lucky if, from the Fischer-Tropsch method in its present form, we can produce gasoline at double the present cost of getting it from petroleum. The synthetic manufacture of gasoline may come in slowly in small plants interested chiefly in the associated products. When large plants are built in this country they will likely be a form of insurance and highly subsidized by the government. Answering questions, Dr. Storch said coal hydrogenation plants will be very choosey in coals as regards the less active splinty materials and ash. Very likely, only coals of under 87 percent carbon will be considered. With present plants of either process it takes about 4 tons of coal to make a ton of gasoline. The Fischer-Tropsch is more flexible than the Bergius-I.G. and all facts point to a more rapid development of the former.

Benzine, obtainable only from coke ovens, is the critical material in our present program for synthetic rubber and the 735,000 tons of Buna S (86½ percent of the total program) will require the carbonization of 20,000,000 tons of coal, said Dr. H. C. Howard, Carnegie Institute of Technology, in his paper on "Synthetic Rubber and Coal," illustrated with lantern slides. Coal, agricultural products and petroleum are the raw materials for rubbers and plastics. The calcium carbide process, by which du Pont makes neoprene (4.7 percent of the total) requires coke. Plasticizers for the synthetic rubbers can also be made from coke-oven products.

Dr. Howard reviewed the price history of natural rubber beginning with 1910 when it jumped from \$1 to \$3.06 per pound and tracing it through the low of 1931 when the price dropped to 2½¢ per pound. Neoprene was first offered at \$1 per pound. He discussed the theory of polymerization and showed diagrams of the molecular structures of many hydrocarbons including the various synthetic rubbers.

W. C. McCulloch, preparation manager, Roberts & Schaefer, scheduled to present a paper on coal preparation, was unable to attend so his time was allotted to a general discussion. H. J. Wagner, chief, gas section, engineering department, West Virginia Public Service Commission, asked for conservation in all uses of natural gas to help avert an impending acute shortage this winter in West Virginia.

W. D. Langtry, president, Commercial Testing & Engineering Co., Chicago, said he believed the coal industry should be very careful now in preparation to avert consequences such as followed the poor preparation of the last war. The coals then supplied to Italy and South America ruined the chances for future exports to those countries. Mr. Smith emphasized the highly promising markets of South America.

Mr. Cothorn, the retiring section chairman, presided at the meetings. His co-chairman on Friday was E. A. Munyan, engineer with the Columbia Gas & Electric Co., subsidiaries, and on Saturday Mr. Smith.

At the dinner Friday evening, Mr. Huntress, in his address on "Private Enterprise and Freedom in the Post-War World," cited the electric-power industry and especially companies serving the West Virginia-Kentucky area, as examples of business under private ownership, by development largely at its own risk, meeting all demands of the war. "Using the equation that 1 kw-hr. of electricity is equal to 10 man-hours of labor," said Mr. Huntress, "wartime American has the services of about 800,000,000 invisible men not subject to direct orders of overlords of two-legged men. This compares with 150,000,000 invisible men available in World War I."

Mine Fatalities Show Sharp Drop

A sharp decline in coal mine fatalities in the United States was revealed in October Bureau of Mines figures showing 64 deaths in bituminous mining, as compared with 90 in September, and 11 in anthracite, compared with 38 the previous month. The total of 75 deaths compared with 103 in October, 1942.

The rate killed per million tons de-

creased in both anthracite and bituminous. The bureau reported 2.06 deaths per million tons in anthracite, compared with 6.98 in the previous month, and 1.31 per million tons in bituminous, compared with 1.74 in September. For the same month last year, the rate was 2.74 in anthracite and 1.72 in bituminous. Bituminous production during October was listed at 48,740,000 tons; anthracite, 5,311,000 tons.

The combined fatality rate for the two industries for October was 1.39, compared with 2.23 in September. Fatalities during October, by causes and states, and comparable rates for the first ten months of 1943 and 1942 are listed below.

Request Reopening In Anthracite Case

The Commonwealth of Pennsylvania, Alden Coal Co., and other complainants, including the Coal Merchants' Association of New York and the Wyoming Valley Industrial Development Fund, Inc., have asked reopening of I.C.C. Docket 27766, the so-called "Tidewater" case, decided against complainants in November. In addition to reconsideration, the complainants again asked that the rates assailed be found unjust and unreasonable and reduced at least 40¢ per gross ton. The petition requested specifically that the full membership of the commission decide the case, if reheard, and not a minority, which previously gave a 5 to 4 decision.

U. S. COAL MINE FATALITIES IN OCTOBER, 1943, BY CAUSES AND STATES

State	Underground										Surface	Grand Total
	Falls of roof	Falls of face	Haulage	Gas or Dust Explosions	Explosives	Machinery	Other causes	Total	Underground	Open-cut		
Alabama	1	1	1	1	1	1	1	1	1	1	1	1
Arkansas	1	1	1	1	1	1	1	1	1	1	1	1
Colorado	1	1	3	1	1	1	1	6	2	2	2	2
Illinois	1	1	3	1	1	1	1	1	1	1	1	1
Indiana	1	1	3	1	1	1	1	1	1	1	1	1
Kentucky	5	1	3	1	1	1	1	11	2	2	2	12
Maryland	2	1	1	1	1	1	1	2	1	1	1	2
New Mexico	1	1	1	1	1	1	1	1	1	1	1	1
North Dakota	1	1	1	1	1	1	1	1	1	1	1	1
Ohio	1	1	6	1	1	1	1	10	1	1	1	11
Pennsylvania (bituminous)	4	1	1	1	1	1	1	2	2	2	2	2
Tennessee	1	1	1	1	1	1	1	1	1	1	1	1
Utah	1	1	1	1	1	1	1	1	1	1	1	1
Virginia	1	1	3	1	1	1	1	4	4	4	4	4
West Virginia	9	1	3	1	1	1	1	14	1	1	1	16
Total bituminous	28	3	21	2	2	2	1	60	1	3	1	64
Pennsylvania (anthracite)	7	1	1	1	1	1	1	10	1	1	1	11
Grand total	35	4	22	2	3	2	1	70	2	3	1	75

DEATHS AND FATALITY RATES AT U. S. COAL MINES BY CAUSES OF ACCIDENTS*

January-October, 1942 and 1943

Cause	Bituminous				Anthracite				Total			
	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942	1943
<u>Underground:</u>												
Falls of roof and coal	517	499	1.071	1.019	112	93	2.215	1.816	629	592	1.179	1.094
Haulage	199	191	.412	.390	32	30	.633	.586	231	221	.433	.409
Gas or dust explosions:												
Local	12	22	.025	.045	6	1	.119	.019	18	23	.034	.042
Major	121	136	.251	.278	14	14	.274	.212	150	150	.227	.277
Explosives	16	24	.033	.049	11	8	.218	.156	27	32	.051	.059
Electricity	44	27	.091	.055	5	1	.099	.019	49	28	.092	.052
Machinery	35	21	.073	.043	1	1	.020	.019	36	22	.068	.041
Shaft	4	7	.008	.014	2	1	.039	.019	6	8	.011	.015
Miscellaneous	29	24	.060	.049	9	10	.178	.195	38	34	.071	.063
Stripping or open-cut	19	18	.039	.037	3	8	.059	.156	22	26	.041	.048
Surface	43	49	.089	.100	10	17	.198	.332	53	66	.099	.122
Grand total	1,039	1,018	2.152	2.079	191	184	3.778	3.591	1,230	1,202	2.306	2.222

* All figures subject to revision.

Adjustable to step up production

★ The American Pulverizer 60-S Crusher shown below was installed for reducing lump and egg to $1\frac{1}{4}$ ". However, it is a special crusher arranged as are all AMERICAN Crushers, to meet the particular requirements of the application.

This 60-S crusher will step up production from normal 300 tons per hour to between 350 and 400 tons per hour producing a 4"x0 product.

American Rolling Ring Crushers are externally adjusted—easily accessible and compact. You can get an American Rolling Ring Crusher in the correct size for your requirements and you can get large daily tonnages of coal properly sized at extremely low cost. We will gladly make recommendations at your request.

...FROM NORMAL
300 TONS
PER HOUR

.. TO BETWEEN
350 AND 400 TONS
PER HOUR PRODUCING
A 4" X 0 PRODUCT

★GREATER RANGE OF REDUCTION

★UNIFORMITY OF SIZE

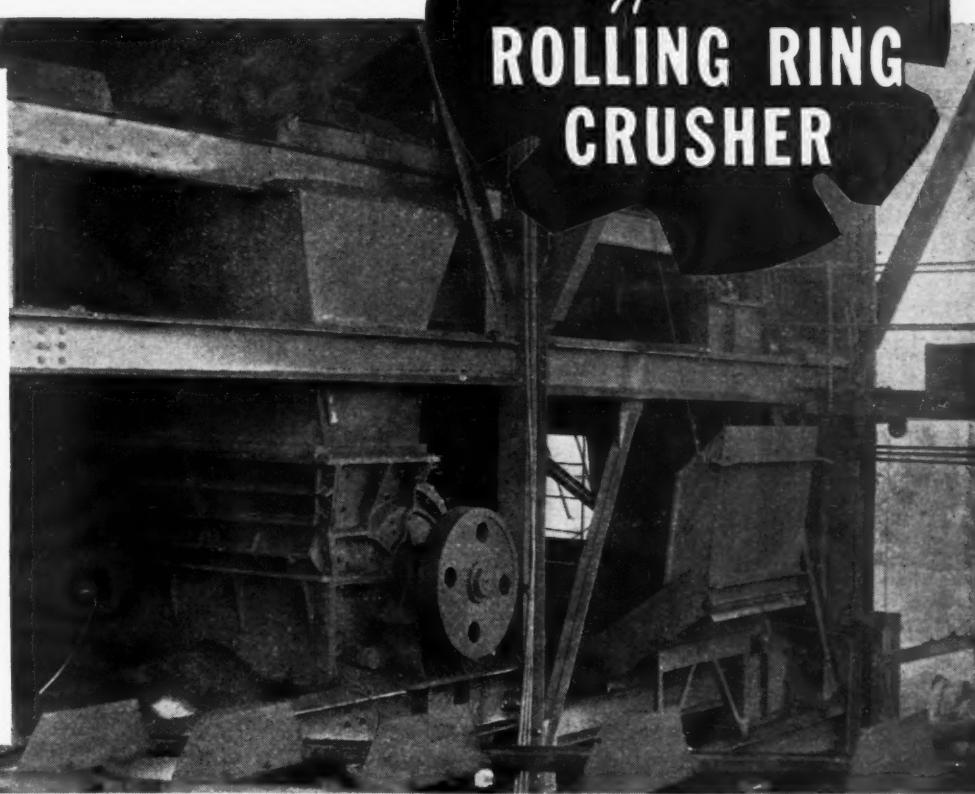
★CRUSHING AT LESS THAN A CENT A TON

★EXTREME SIMPLICITY OF OPERATION



The splitting action of the SHREDDER RINGS shatters and distributes the coal before it reaches the Breaker and Grinding Plates. These patented reversible manganese steel SHREDDER RINGS are found only in the American Rolling Ring Crusher. They have twenty cutting edges or teeth and are designed to maintain their outward position by centrifugal force at the specified speeds. In contact with solid metal, the rings are momentarily deflected from their usual course because they are free to swing back out of position. There are no shear pins or other safety devices that require attention.

AMERICAN
Type "S"
ROLLING RING
CRUSHER



AMERICAN PULVERIZER COMPANY 1119 MACKLIND AVENUE
ORIGINATORS AND MANUFACTURERS OF RING CRUSHERS AND PULVERIZERS
ST. LOUIS, MISSOURI

Hydrogenation Plant Proposed in Canada

Construction of a hydrogenation plant by the Dominion government at a cost of about \$400,000 was proposed last month to the Canadian House of Commons Reconstruction Committee by Resources Department officials.

A small government plant is now in operation, but the Resources Department officials told the government its capacity is too small for all experiments they wished to make. Construction of the plant, the officials said, would be an important factor in finding substitutes for gasoline from coal and other raw materials. Canadian oil reserves are capable of producing only 17 per cent of the country's consumption and B. F. Haanel, chief, fuel division, Resources Department, said a large part of future gasoline must come from substitutes. Other officials who urged construction of the plant were W. B. Timm, director of mining and geology branch, and Dr. T. E. Warren, fuel division chemist.

Experiments at the present small plant indicated that bitumen from Alberta tar sands would yield 194 gal. of gasoline per ton. Sydney, N. S., coal yielded about 143 gal. a ton; British Columbia coal, 121; Drumheller, Alberta, 93; Bienfait, Sask., 68; and Northern Ontario, 50. Coal was also used for power in the experiments, and on that basis it was estimated that the yield of gasoline would not be more than one ton for four to five tons of raw material.

Canadian officials are viewing the petroleum situation with much concern. The proposed plant would have a capacity of 200 gal. a day and would permit experiment on physical and engineering factors impossible at the smaller plant.

Principal oil sources in Canada are Turner Valley, Alberta; Fort Newman, N.W.T., and Vermilion and Wainwright, Alberta. No important discoveries of reserves have been made in recent years.

Hudson Wage Suit Argued Dec. 3

Arguments in the action brought by 37 employees against the Hudson Coal Co., Scranton, Pa., to recover approximately \$100,000 in alleged overtime, liquidated damages and attorneys' fees under the Fair Labor Standards Act took place in the federal court at Scranton Dec. 3. Hudson, in its answer, had argued, among other things, that the employees' claim had to be submitted to the Board of Conciliation for adjudication under the arbitration provision of the anthracite wage agreement. Thereafter, Hudson's attorneys filed a motion to stay any further proceedings pending such arbitration. The argument Dec. 3 included this motion.

Arguing, in general, that certain sections of the agreement are not legal, and that certain resolutions of the Conciliation Board indicated that rates complained of were fictitious and for the purpose

evading the provisions of the act, plaintiffs' attorneys contended that they were not bound by a recent decision of the Circuit Court of Appeals at Philadelphia. In this case, *Donahue vs. Susquehanna Coal Co.*, Susquehanna was successful in staying the trial of a similar action, and attorneys for the plaintiffs sought to distinguish between the Hudson and Susquehanna cases on the ground that the legality of the anthracite wage agreement was not challenged in the Susquehanna action and in fact plaintiffs had relied on the agreement. In the Susquehanna case, a motion for a rehearing has been denied by the Circuit Court of Appeals and the employees have taken no appeal from that decision.

Two More Agencies Inspect Anthracite

The Anthracite Committee, administering the production control plan for the anthracite industry, has placed four inspectors in the anthracite fields to check on quality and sizing of coal in accordance with standards adopted by the committee effective Dec. 15, 1943. Under this plan, the inspectors, who have no authority to condemn coal, forward a copy of their report to the committee and leave a copy with the colliery officials. Testing is conducted at the point of sampling whenever facilities exist.

R. Y. Williams, mining engineer, Pottsville, Pa., has been appointed consultant in maintaining minimum ash standards recently set up by the Solid Fuel Administration for War.

Mine Inspector Exam

The U. S. Civil Service Commission announced a new examination last month for coal mine inspectors in the Bureau of Mines field service. The positions pay \$3,163 to \$5,228 a year, including overtime, and require from five to eight years' practical experience in coal mining, which must include safety-of-operation work and some specialized work in a supervisory capacity. Applicants will be rated partly on written test, which will include questions based on specific knowledge and also will test ability to make written reports. Minimum age is 30 and maximum 55.

Applications, which may be obtained at first or second class post offices, at the Civil Service Commission's regional offices or from the Commission at Washington, D. C., must be filed with the Commission, Washington 25, D. C., not later than Jan. 20, 1944. Persons engaged on their highest skill in war work should not apply.

Pa. Coal Land Sold

The Monroe Coal Mining Co., Johnstown, Pa., a subsidiary of J. H. Weaver Co., Philadelphia, has purchased 16,075 acres of coal land in Cambria and Indiana counties from the Bethlehem-Cuba Iron

Mines Co., a subsidiary of the Bethlehem Steel Co., it was announced last month. Monroe has also acquired 2,000 acres of surface land in Indiana County and 238 homes in Heilwood, Mingo and Glenville.

Start C. & O. Branch

The Codell Construction Co., Winchester, Ky., and the Anderson Construction Co., Asheville, N. C., were awarded contracts last month for construction of a 29-mile branch of the Chesapeake & Ohio Ry. from Millard, Ky., at the forks of the Big Sandy, up Levisa Fork to the Virginia state line. Work was to be started at once.

The Norfolk & Western Ry. is starting construction of a 10-mile branch from the West Virginia border to the territory to be crossed by the C. & O. branch.

It is reported that a number of coal companies are ready to undertake extensive development work in the area of the two new branches.

New York Anthracite Rationed by Ickes

Couponless rationing of anthracite coal, limiting consumers in the New York City area to 87½ percent of their last winter's supply, was announced on Dec. 14 by Solid Fuels Administrator Harold L. Ickes.

The order was transmitted to Walter J. Dockerill, regional solid fuels administrator for New York. Mr. Dockerill said that while the order applied only to New York, it was expected it would be enlarged to include all anthracite consuming areas.

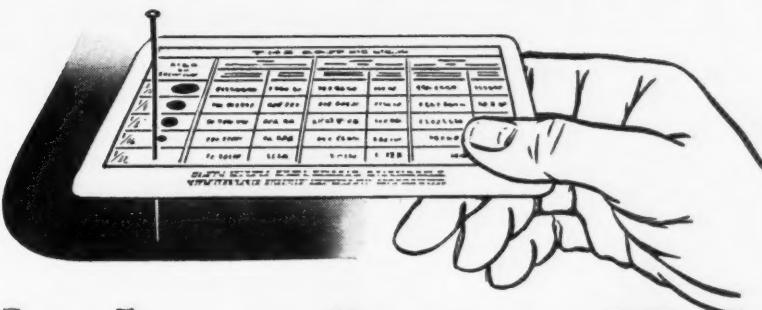
No coupons will be required for the rationing. Dealers are simply limited to supplying consumers with more than ½ of the coal they used between Sept. 1, 1942, and March 1, 1943. Penalties for violations against both consumer and dealer are provided. Previously orders had been issued by the SFA limiting consumers to 90 percent of last year's supply, and imposing restrictions on the amount a consumer could have on hand at any one time.

Meanwhile, a strike which tied up 311 freight cars of anthracite in the yards of the Central Railroad of New Jersey at Jersey City for several days was settled on Dec. 13. A work stoppage by car unloaders prevented delivery of the coal to New York city consumers during the most severe cold spell of the season thus far.

Frank W. Earnest, Jr., president, Anthracite Industries, Inc., commenting on the rationing order, said excessive temperatures in homes burning hard coal would have to be reduced unless conservation steps resulted in enough saving of fuel to offset the 12½ percent reduction. "Dirty and faulty heating equipment," he said, "is responsible for at least 10 percent waste in heat."

Increased demand for anthracite, Army requirements, oil conversions, and new wartime housing developments were cited by Mr. Earnest as contributing factors in the anthracite situation. He said produc-

How Big is a pinhole in a COAL MINE?



Big enough to cause a lot of trouble — when the pinhole is in the seating of a valve that's supposed to be shut off *tight*.

Here's the story in terms of normal pressures:

At 100 lbs. — STEAM — 3,175 lbs. wasted per month per valve

At 100 lbs. — AIR — 69,552 cu. ft. wasted per month per valve

At 40 lbs. — WATER — 4,800 gals. wasted per month per valve

This is just a $\frac{1}{32}$ " hole, at normal pressures. A pinhole across the seat of a 1" valve is a leak that might have called for a new valve before the war. In a 16" valve, on the other hand, it may be regarded as "normal seepage."

The point is, you can *reseat* ANY globe valve from $\frac{1}{4}$ " to 14"; or ANY gate valve from $1\frac{1}{2}$ " to 48", *without removing it from the line*, and you'll come out with a valve that doesn't leak at all! . not even "normal seepage!" All you do is remove the bonnet and insert a Dexter Valve Reseating Machine. In a few minutes you have cut a new face on the ports:



Have you any leaky valves? Write us about them — we'll recommend the Dexter Valve Reseating Equipment that will handle your situation economically.

a face that is true — in fact, better than usually found in a new valve.

There are Dexter outfits specially designed for reseating reciprocating pump valves from 2" to 15".

In most cases a valve can be reseated on the line in less time than would be required for removal and replacement.



THE LEAVITT MACHINE COMPANY
ORANGE, MASSACHUSETTS

tion would be within 3.5 percent of last year.

Ickes announced on Dec. 15 that he had informed the governors of 11 anthracite-consuming eastern states that shipments on state contracts of the usual domestic sizes of anthracite would be reduced 50 percent beginning Jan. 1. Ickes said public buildings could more easily adapt their firing methods to bituminous, and that the hard coal thus saved would be made available to smaller users.

States affected were Connecticut, Delaware, Massachusetts, Maine, Maryland, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont.

Ceilings of dealers in Pennsylvania anthracite yard screenings were increased 50c a ton on Dec. 20 by OPA to enable the dealers to pass on the recent increase in operating costs occasioned by the wage agreement.

Ask \$3,500,000 For Allocation

A special supplemental appropriation of \$3,500,000 was approved by a Senate Appropriations subcommittee Dec. 4 for the use of the Solid Fuels Administration for War. The approval was the result of a request by Secretary Ickes for funds to set up coal-allocation centers in 65 cities to meet "critical needs" and thus offset what he termed "a fuel crisis unparalleled in the history of our country." Under the program, the field offices will alleviate supply shortages "by direct and local action where possible."

Community House Planned at Holden

Plans for construction of a two-story community center around which will be built a seven-point recreational and civic program for Island Creek Coal Co. communities were announced last month by the Logan-Mingo Community Association, Holden, W. Va. Dr. W. W. Curry, president of the association, said that Robert Ingersoll Willet, Huntington (W. Va.) architect, had completed drawings for the building.

The building, to be constructed at Whitman Park, Holden, will house facilities for sports, recreation, health, education, social welfare, fellowship and citizenship. The plans call for a colonial steel, brick and concrete structure 212 ft. wide by 162 deep.

Among the facilities to be provided at the center will be bowling alleys, snack bars, a billiard room, a memorial lounge, in which a tablet of the Island Creek honor roll will be placed; a gymnasium with college-sized basketball court and seating capacity for 1,000; various assembly and meeting rooms, a dining room seating 75 and a banquet hall, library, reading rooms, locker rooms, showers, steam room, sun-lamp room and massage rooms. The site of the building is adjacent to the present swimming pool.

Included in the sports and health program of the association will be basketball, indoor baseball, indoor tennis, volleyball, badminton, track, dancing, boxing, roller skating, bowling, swimming, softball, billiards, gymnastics, ping pong, wrestling, handball and tumbling. Social activities planned will be dances, bridge parties, dinners, Boy and Girl Scout activity, group entertainment and benefits.

In addition, the association plans to conduct classes and lectures on salesmanship, public speaking, foremanship and current events. Officers of the group, in addition to Dr. Curry, are J. B. Babyak, vice-president; E. F. Clevenger, secretary-treasurer; J. J. Foster, R. S. Flint, R. E. Salvati and C. McD. England, directors.

Get Price Increase

Bituminous underground mines in District 15 were granted an increase in ceiling prices ranging from 25 to 60c. a ton by the Office of Price Administration on Dec. 10. Simultaneously, individual adjustments granted the mines were revoked, and OPA said the actual price ceilings would remain virtually the same.

Strip mines in the district were not affected. Underground mines produce about 20 percent of the district's tonnage.

The increases were granted because of increased costs due to the recent wage rises. They are in addition to the general increase of 25c. a ton granted all underground bituminous mines in the district Nov. 29.

Most products of bituminous coal in Indiana were given an increase of 5c a ton by OPA on Dec. 17. Excluded were entirely hand-operated mines, which participated in the general increase granted Nov. 20. The rise can be passed on to the consumer at once, OPA said. OPA said the additional increase was granted because it had been informed by the Solid Fuels Administration that a 3c error had been made in computing the 1942 margin of Indiana producers.

Two price increases were also announced for coke. A jump of 75c a ton in producers' ceiling prices for beehive oven coke

produced in hand-drawn ovens, f.o.b. Connellsville, Pa., brought the price from \$7 a ton to \$7.75.

Thirty cents per net ton was allowed producers of by-product and retort gas coke in Alabama, Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Tennessee, Wisconsin and that part of Ohio west of a line running north and south through a point immediately west of Cleveland.

Reopen Mine

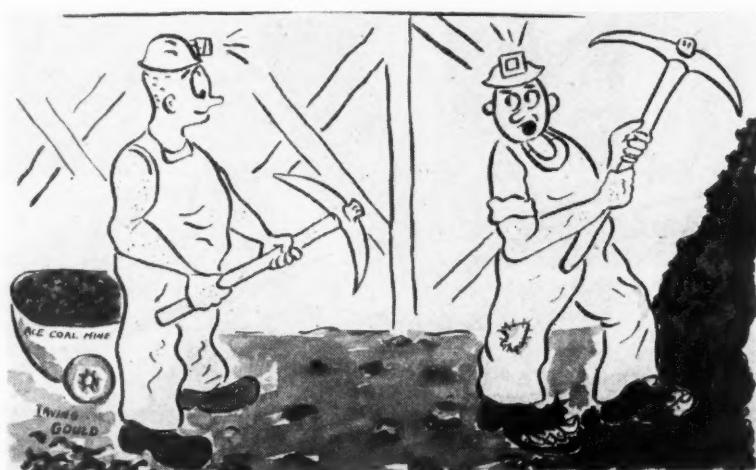
President Joseph Pursglove Jr., of the Pursglove Coal Mining Co., announced late last month that Pursglove No. 15 mine, at Morgantown, W. Va., scene of a fatal fire last January 8, would be opened shortly on a "limited production" basis. Mr. Pursglove said a new drift mouth would be used and a new shop and lamp house constructed. The mine was flooded and sealed following the fire, but the company president said some of the machinery had been recovered and repaired. The operation normally employs 380 men.

Lewis Is Charged With AFL 'Raids'

John L. Lewis's efforts to obtain readmission into the American Federation of Labor were reported last month to have struck a new snag when A.F.L. members taxed him with using District 50 of the United Mine Workers to enroll members rightfully belonging to more than a score of federation unions.

Lewis and an A.F.L. committee headed by Daniel J. Tobin, International Brotherhood of Teamsters, met in Washington to discuss the readmission. No announced action was taken and it was considered likely none would be until after the quarterly meeting of the A.F.L. executive council late this month.

A plan whereby the Progressive Miners of America would retain its own jurisdiction if the U.M.W. is readmitted was reported under discussion.



"MY WIFE TOOK MY SHOE RATION TICKET, . . . SHE SEZ NOBODY'S GONNA SEE ME DOWN HERE ANYWAY!"

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More Coal!
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Here are three *well-proven* facts that deserve your full consideration.

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Third, you can protect the eyes of *all* of your workers for

less than 1/20c per ton. *And in some districts, insurance credits more than cover the investment needed to buy the equipment.*

Call in your M. S. A. representative and have him search out every eye-hazardous job on your property. He will have the right AO Goggles for every eye-hazardous operation . . . goggles that are strong, yet light, too — and comfortable to wear.

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REPRESENTED IN THE COAL MINING INDUSTRY BY MINE SAFETY APPLIANCES COMPANY, PITTSBURGH, PA.

New Carbon Source Is Found in Coke

Seeking a new source of carbon suitable for making the electrodes required in the production of aluminum, U. S. Bureau of Mines chemists have found that mineral impurities in three low ash domestic coals may be reduced sufficiently by float-and-sink and acid-leaching processes to yield a coke of the desired quality, Dr. R. R. Sayers, director, announced Dec. 15.

Calcined petroleum coke is the standard material for making electrodes for aluminum. Considering the possibility of the need for a substitute material, the bureau turned to coke from coal and examined seven low ash eastern Kentucky and Alabama coals.

Five of the seven coals tested by the float-and-sink method yielded products with appreciably less than 1 percent ash but even these contained more mineral impurities than was desirable. By treating float coals with an acid solution containing 10 percent hydrochloric and 5 percent hydrofluoric, products with an ash content as low as 0.31 percent were obtained. The bureau conceded acid-leaching would be expensive.

A copy of the report may be obtained by writing the bureau at the Department of the Interior, Washington 25, D. C., for report of investigation 3731.

Canadian Miners Get Wage Increase

Wage increases of \$1 a day and a week's vacation with pay were granted last month to 12,000 Nova Scotia coal miners by the Canadian National War Labor Board, which took the occasion to censure the United Mine Workers and a Royal Commission which earlier had recommended a similar increase for miners in Alberta and British Columbia.

Meanwhile, J. L. Ilsley, Minister of Finance, warned that the increases would cause a rise in the price of Canadian coal and early last month, some operators in Alberta and British Columbia were authorized by Coal Administrator E. J. Brunning to raise their prices from 10 to 65 cents a ton.

District 26 of the UMW had asked an increase of \$1.25 a day for Nova Scotia miners and the War Labor Board indicated it was granting the rise only because of the previous action in the British Columbia and Alberta strikes. That increase, the War Labor Board said, "once again demonstrated that outlaw methods properly timed make quite an impression."

The board commented: "We feel that we must extend to the Nova Scotia miners substantially the same treatment as has been wrung by Mr. Livett (Robert Livett, president, District 18, UMW) and his associates from the pockets of the consuming public and from the pockets of workers whose destinies Mr. Livett in a professional capacity is supposed to guide."

Nova Scotia operators, opposing the increase, said it would cost \$15,460,225 a year, or \$3.44 a ton on the basis of 1942 production figures.

The increase applied only to employees of the four major companies, the War Labor Board told a convention of District 26 on Dec. 9. Companies affected were Dominion Coal Co., Acadia Coal Co., Old Sydney Collieries, Ltd., and Cumberland Ry. and Coal Co. The board said wage demands of employees for the seven remaining companies would have to be made in special applications.

Speaking of the increase in price, Mr. Ilsley said: "In the circumstances, the government has decided that its only alternative is to allow a price increase since it is obvious that to meet situations of this kind by granting subsidies is to put a premium on strikes at the cost of the already overburdened taxpayer."

The War Labor Board also granted wage increases, payment of the full cost of living bonuses and time and a half for overtime to miners in the Estevan, Sask., region, despite a warning by C. H. Thomson, manager, Saskatchewan Coal Co., Ltd., that such action would necessitate an increase in price to the consumer.

Canadian coal dealers were ordered last month to give preference to householders with less than 7 days' supply on hand. Mr. Brunning ordered dealers to deliver 15 days' supply or one ton, whichever is less, in such cases. After the needs of such customers have been filled, the Department of Munitions announced, dealers were to fill orders of consumers having less than one-quarter of their year's requirements.

Effective Nov. 27, the Canadian government subsidized Ontario importers of American anthracite in order to take up the increase resulting from the wage increases in the United States. Toronto retailers, the government said, would maintain their price to consumers as a result of the subsidy. An official of the Regional Coal Control office said that reports that prices in Toronto would be increased 60 to 65 cents a ton were "definitely wrong."

The coal situation in Canada, C. D. Howe, Minister of Munitions, said early last month is "much better than we had any right to anticipate," and added no Canadians would go cold this winter if all consumers are careful. He said a mild autumn had resulted in a saving of 10 percent up to Dec. 1.

Mr. Ilsley announced on Dec. 15 that the government had decided to authorize a price increase in coal produced at Nova Scotia fields where the wage increase was effective. The Wartime Prices and Trade Board was directed to determine the amount.

Two days later, District 26 at its annual convention at Sydney, N. S., voted to raise dues 50c per member, bringing additional income of \$60,000 a year. The money will be used, union officials said, to finance the union newspaper, give increased salaries and cost-of-living bonuses to union officers, and finance a research director.

Coal production in Alberta for ten months of 1943 was 6,447,673 tons, an increase of 206,838 tons over 1942, A. A. Millar, chief inspector mines, reported late last month. October output increased 35,067 tons over 1942, but because of strikes, a sharp decrease was anticipated for November.

Buy Arkwright Stock

Northwest Fuels Co., a wholly owned subsidiary of Consolidation Coal Co., has purchased the stock of Arkwright Coal Co., operating in Monongalia County, West Virginia, for \$800,000, it was announced last month at Morgantown, W. Va.

Arkwright has made a lease with the Cochran Coal & Coke Co. with option to purchase at a price of \$1,025,000 for mining 450 acres of coal which it had been working under a previous lease. Consolidation a few weeks prior to the Arkwright stock purchase negotiated a lease to permit Arkwright to develop 12,000 acres adjacent to the Cochran tract.

Buy Coal Lands

Announcement was made late last month of the sale of about 40,000 acres of coal holdings in Preston County, West Virginia, by the Bethlehem Steel Co. The purchasers were Earl Swartzwelder, C. E. Gustkey and Dr. E. E. Watson, of Preston County. Representing Bethlehem at the sale were J. W. Blair, Johnstown, Pa., superintendent of the Preston division, and Paul J. Ganey, Bethlehem, Pa., superintendent of real estate. The price was listed as "in excess of \$200,000."

The property embraced all of the steel company's holdings in Preston County, operating equipment near Masontown and Reedsville and all of the village of Bretz. The mines have not been operated for several years.

New Books on Coal and Coal Subjects

Geology, by J. A. Allen, Research Council of Alberta, Edmonton, Alta. Report 34, 202 pp., 6 $\frac{1}{2}$ x 10 in. Price \$1.50. Paper. General geology of Alberta, rock-salt deposits at Waterways, geology of Alberta soils, relief model of Alberta and coal areas of Province.

A Technical Manual for the Rescue Service, Office of Civilian Defense, Publication 2216, Superintendent of Documents, Washington 25, D. C. 5 $\frac{1}{2}$ x 9 $\frac{1}{2}$ in., 142 pp., Paper.

How to Train Workers Quickly, by Glenn Gardiner, Elliott Service Co., 62 pp., 5 $\frac{1}{2}$ x 7 $\frac{1}{2}$ in. Price 45c. Paper. A manual for training men and women in wartime.

Publications

Effect of Acids and Alkalies Upon Carbonization Products of Coal, by R. E. Brewer, U. S. Bureau of Mines, R. I. 3726, 20 pp., mimeograph.

Fires in Surface Mining and Milling Structures, by D. Harrington and J. H. East, Jr., U. S. Bureau of Mines, I. C. 7250, 9 pp., mimeograph.

Some Information on the Transportation, Storage and Handling of Lubricants

in and About Coal Mines, by D. S. Kinney, U. S. Bureau of Mines, I. C. 7244, 15 pp., mimeograph; includes drawings of equipment for transportation of lubricants.

Hydrogenation and Liquefaction of Coal; Part IV, Effect of Temperature, Catalyst and Rank of Coal on Rates of Coal Hydrogenation Reactions, by H. H. Storch, C. H. Fisher, C. O. Hawk and A. Eisner, U. S. Bureau of Mines, T. P. 654, 50 pp., paper.

Byproduct of Coke Oven Tests of Washington Coals, by H. F. Yancey, Joseph Daniels, E. R. McMillan and M. R. Geer, U. S. Bureau of Mines, R. I. 3717, 34 pp., mimeograph.

Some Small Coal Jigs for Mechanical Cleaning of Coal at Truck Mines and Other Lower Tonnage Operations, by B. W. Gandrud and G. T. Bator, U. S. Bureau of Mines, R. I. 3718, 29 pp., mimeograph.

Coal Mine Modernization, 1943 Year Book, American Mining Congress, Washington, D. C. 6x9½ in. 235 pp. Price, \$2. Cloth.

Salvage Manual for Industry, Technical Service Section, Industrial Salvage Branch, Salvage Division, War Production Board, (free from E. F. Mulligan, Salvage Division, War Production Board, 1100 H Street, N. W., Washington, D. C.); later from Superintendent of Documents, Washington, D. C.; price, 50c.); 6x9½ in., 243 pp., paper.

Men and Coal, by McAlister Coleman, Farrar & Rinehart, New York; 350 pp., 5½x8½ in. Price, \$3. Cloth. A book that gives a drab and grim story of the American coal miner, but the answer is easy. With all their roving habits that make them fit from mine to mine and without any atavistic attachment that holds some men to the industry of their fathers, coal miners usually stay in the mines despite irregular working time. The answer is good wages, freedom from restraint, an atmosphere that is never too hot nor too cold and insurance of work, that if not always steady the year round, rarely folds up and leaves them stranded.

Twenty-First Annual Report of the Safety in Mines Research Board, 1942, British Bureau of Information, 30 Rockefeller Plaza, New York; 23 pp., 6x9½ in. Price 30c. Paper. Rock-dust experiments, results of which will be covered in Foremen's Forum shortly. Firedamp explosions, electrical researches, mining explosives, roof and coal falls, roof supports, roof control, haulage and wire ropes are other subjects.

Accidents Due to Misuse of Explosives, by D. Harrington and J. H. East Jr., U. S. Bureau of Mines, I. C. 7262, 14 pp., mimeograph.

Receives Charter

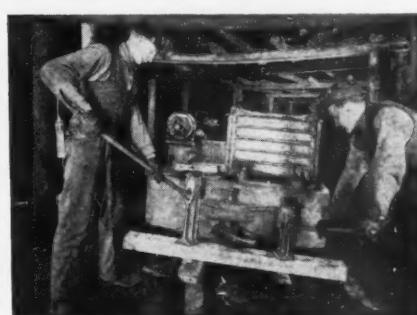
The Powellton Coal Co., Huntington, W. Va., was issued a state charter last month. Its principal works will be in the Triadelphia district of Logan County. Incorporators are R. E. Salvati, P. E. Francis, both of Huntington, and G. J. Stollins, Mallory.

SAVING MANHOURS WITH DUFF-NORTON JACKS



Dangerous roof conditions are overcome with the safe, strong, easy-to-spot Duff-Norton Mine Roof Jacks . . . available for use under any type of working condition.

EXPERIENCED mining operators are making full use of the speed, dependability and easy operation of handy Duff-Norton Jacks to save man-hours of manual labor. With a 1943 goal of 665,000,000 tons for the industry, these operators are taking advantage of the possibilities of Duff-Norton Jacks for saving time and labor on every job of lifting, lowering, pushing and pulling.



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Duff-Norton Jacks are made in many types and sizes to do all types of work. Catalog 302, yours on request, gives complete data.

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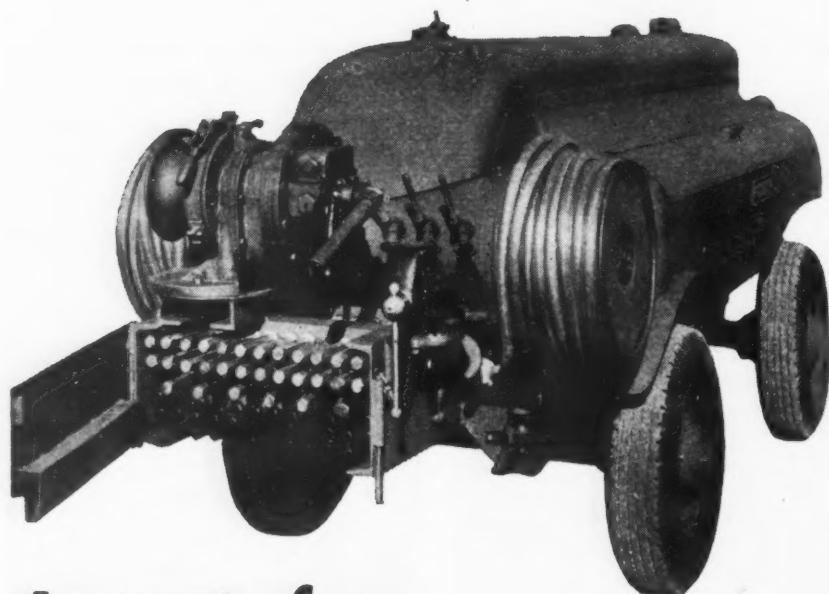
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Mine operators in distant or inaccessible locations have reason to appreciate Schramm air compressors—and install them in ever-increasing numbers.

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Outstanding Schramm features responsible for this 24-hour-a-day performance are: 100% water cooling...mechanical, cam-operated intake valve...large discharge valves in head...forced feed lubrication to every moving part, through oil lines drilled in metal...main bearings for each cylinder...safe, fast, easy starting merely by pushing a button! Too, there's weight reduction up to 40% without sacrificing an ounce of ruggedness. This means a compact, lightweight Schramm offering you more advantages. Write today for details in Catalog 42-PA.

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Obituaries

I. S. RAMSEY, 60, superintendent of the Elk Horn Coal Corp., died suddenly of a heart ailment on Dec. 20 near his home at Fleming, Ky. He was 60 years old. Mr. Ramsey was born in Fairmont, W. Va., and had been connected with Elk Horn for several years, serving at the time of his death as superintendent of Mines 2, 3, 4, 5, and 6.

WILLIAM C. ARMSTRONG, 71, assistant mine manager, Orient No. 1 mine of Chicago, Wilmington & Franklin Coal Co., Chicago, died Dec. 13 of a heart ailment at Benton, Ill.

WILLIAM J. BORRIES, president, general manager and mining engineer, Dawson Daylight Coal Co., Dawson Springs, Ky., died at Madisonville, Ky., Nov. 28 of pneumonia after several days' illness. He had been in poor health for a year. Surviving are his widow; two sons, William A., assistant general manager of the company, and Kent Borries; and a daughter, Mrs. Kennedy Clark. Mr. Borries had long been active with the Dawson company.

CARL JOHNSON, 50, superintendent of the R. C. Tway Coal Co., Harlan, Ky., died at his home in Harlan Dec. 5 after a brief illness. Mr. Johnson had been associated with the Tway company for three years and was formerly with the Blue Diamond Coal Co., Blue Diamond, Ky. He had been active in the coal industry in eastern Kentucky for more than 30 years.

JOHN A. SCHMITT, 44, coal specialist for the OPA in the Scranton, Pa., area, died in Mercy Hospital, Scranton, Dec. 11 following an operation. He was associated with the Cleveland-Cliffs Iron Co., Cleveland. Mr. Schmitt had held his OPA office since February and supervised price and coal quality in a 10-county area with headquarters at Scranton. He was formerly associated with the Haddock Coal Co., Scranton.

WILLIAM WISE MILLER, 65, died at his home in Charleston, W. Va., Dec. 13. He was treasurer and general manager, Hatfield Campbell Creek Coal Co., and vice-president and director, Lincoln Coal Co., both Cincinnati. He was also past president of the Hazard (Ky.) Coal Operators' Assn. and of the Kanawha (W. Va.) Coal Operators' Assn.

Personals

E. B. ROWE, formerly assistant to the vice-president, Union Collieries Co., Pittsburgh, has been appointed general superintendent of the Purglode Coal Mining Co., Morgantown, W. Va. At one time Mr. Rowe was manager of the coal department of the Monongahela Valley Traction Co., Fairmont, W. Va.

WALLACE COMBS, Hazard, Ky., has been made assistant to Manager P. W. Slempe at the Elkhorn Junior Coal Co., Millstone, Ky. Mr. Combs was formerly with the Four Seam Coal Corp.

R. L. PRICE, Whitesburg, Ky., formerly

with the Elkhorn Junior Coal Co., Millstone, Ky., has been made manager of the P. & D. Coal Co., Whitesburg. The company has mines in the Fleming, Ky., area.

J. S. FARINISH, Jenkins, Ky., has been appointed labor commissioner by the Northern West Virginia Coal Operators' Association to succeed the late Frank S. Jorgensen according to an announcement made at Fairmont, W. Va., Nov. 29. Mr. Farinish was previously director of employees' services for the Kentucky division, Consolidation Coal Co., and will move from Jenkins to Fairmont to assume his new duties.

W. T. BROWN, consultant in coal, coke and by-products, has opened an office in the Grant Building, Pittsburgh. He was formerly manager of coal, coke and by-product research for Jones & Laughlin Steel Corp., Pittsburgh.

Lt. Col. JOHN C. GROOME has been released subject to recall from military service in order to resume active management of the Cranberry Improvement Co., Hazleton, Pa., of which he is president. Colonel Groome has been on duty as chief, domestic division, General Staff, War Department.

STANLEY H. MOONEY, former district inspector, West Virginia Department of Mines, Madison, W. Va., has been appointed chief mine inspector (coal and ore mines), Woodward Iron Co., Woodward, Ala.

ROBERT H. MORRIS, general manager and director, Gauley Mountain Coal Co., Ansted, W. Va., was elected vice-president in charge of operations at a meeting of the board of directors last month. Mr. Morris has been with the company since 1917. M. L. ALLEY was named general manager.

W. H. LESSER, Pierce Management, Inc., Scranton, Pa., has been appointed by Governor Martin to the board of managers of registered professional engineers in the Commonwealth of Pennsylvania.

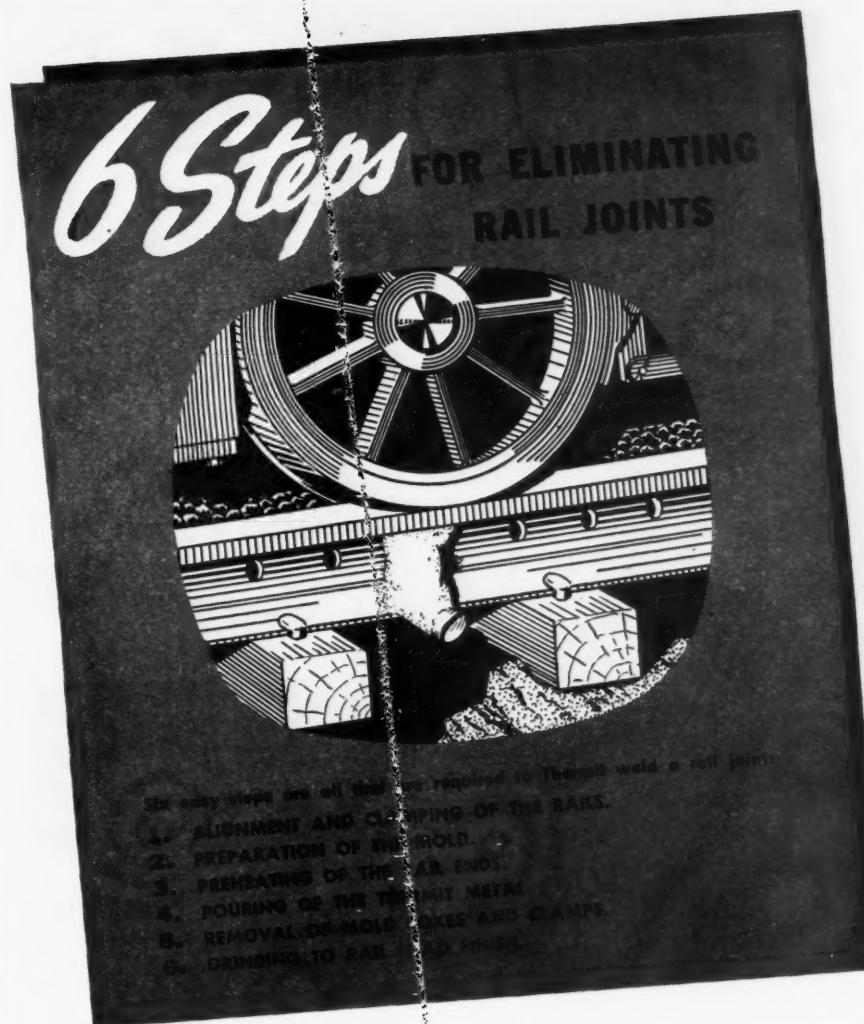
GEORGE C. BARNES, JR., has resigned as senior engineer, West Virginia Engineering Co., Williamson, W. Va., to accept appointment as assistant professor of electrical engineering, Virginia Polytechnic Institute, Blacksburg, Va.

W. C. CASSELL has resigned as electrical engineer with Inland Steel Co., Wheelwright, Ky., to accept a position with the West Virginia Engineering Co., Williamson, W. Va.

WALTER WRIGHT, formerly superintendent, High Point mine No. 1, High Point Coal Co., Carryville, Tenn., has been appointed superintendent of the O. & W. Coal Co., Coleman, Tenn.

EARL CROSS has resigned as superintendent and chief engineer, Pruden Coal Co., Pruden, Tenn., to devote full time to his contracting construction business.

JOHN G. CLINE, formerly with Rochester & Pittsburgh Coal Co., Indiana, Pa., has resigned to accept the position of superintendent with the Raleigh Wyoming Coal Co., Elkhorn, W. Va.



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A crew of six men and a foreman can install as many as twenty-five life-long welds a day...welds that eliminate pounding at joints, reduce power consumption and lengthen the life of both rails and rolling stock. In new construction Thermit welded rail joints conserve the critical steel and alloys needed for plates and bonds. Send for your copy of the concise, informative booklet, "Continuous Rail for Main Haulage Track."

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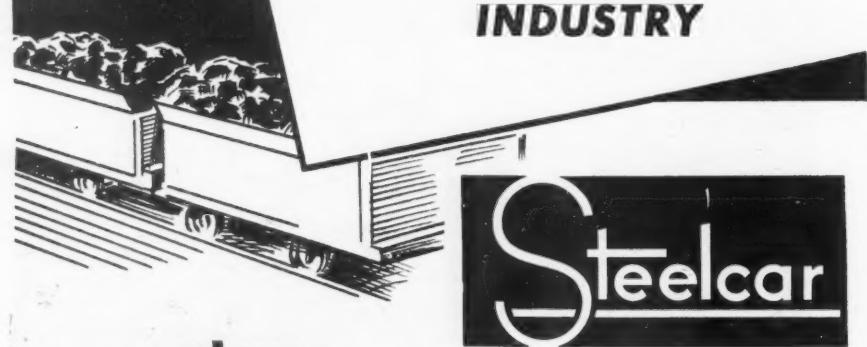
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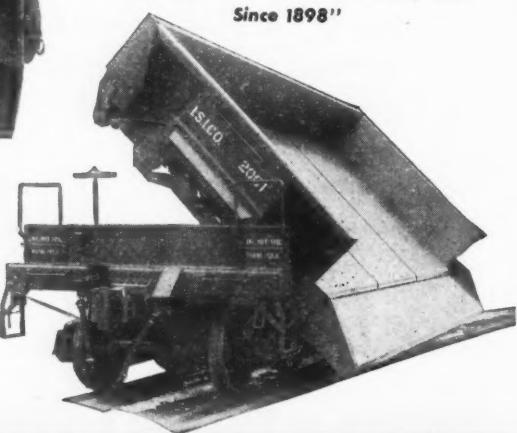
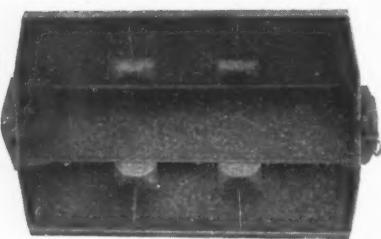
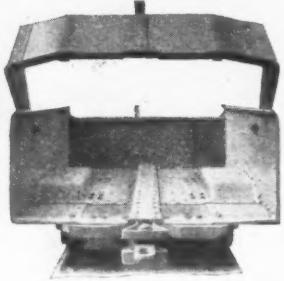
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IN THE MINING INDUSTRY



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PITTSBURGH, PA.

Payrolls Decline

Coal mine payrolls in West Virginia showed a slight decrease during October from the previous month, figures released by the Workmen's Compensation Department revealed. October payrolls were \$58,554,011 compared to \$58,831,615 in September.

The average monthly wage for miners in October was estimated at \$201.31 compared to \$202.72 in September. The decrease was laid to work stoppages during October.

Ballot for Service In British Mines

"Miners have done a very good job in this war. They are getting older, and we have got to give them more manpower." This was the tribute paid to British miners by Labor Minister Ernest Bevin when he talked to me after the announcement in the House of Commons that men for the pits are to be selected by ballot," states Gordon Schaffer in a release by the British Information Services.

"Mr. Bevin is confident he will have the full cooperation of the Mineworkers' Federation, 600,000 strong, the miners' trade union, in this spectacular move to solve the problems of coal output. 'Miners,' he said, 'will appreciate this method of selection. In the past war, when Britain had to bring back miners from the battlefield, miners themselves decided to make the choice by ballot.' Ever since Mr. Bevin told the mine workers' annual conference in the summer he would have to consider compulsory directing of men to the mines, the government has been searching for a scheme which would insure complete equality.

"First, the voluntary method was tried. Men called up for service were given the opportunity of choosing pits in preference to the armed forces. A few thousand volunteered but most of Britain's young men preferred the dangers of the battlefield.

"Under the new ballot scheme, a junior girl clerk at the Ministry of Labor, under the supervision of Mr. Bevin, will draw from a hat a figure from naught to nine. Men in the age group selected, whose military registration number ends with the figure drawn, will be called up for the mines. They will come mainly from 18 year olds but there will be some up to 25 whose deferment from national service expired.

"The call-up will thus be a complete cross section of the nation. Rich men, poor men, they will come from town and country alike. The call-up will provide 30,000 men and will continue to replace the annual wastage of about 20,000 through death, old age and sickness. The social consequences of this decision will be very great. As Mr. Bevin said to me: 'The coal industry has been too isolated from the rest of the community.' You have only to go into the villages in various coal fields to realize the truth of this statement. The life of a village often depends on a single pit. In days of unemployment, a closed pit meant tragedy for practically every family. Inevitably miners drew into their shells. Young men

drifted from the coal fields to find jobs in towns.

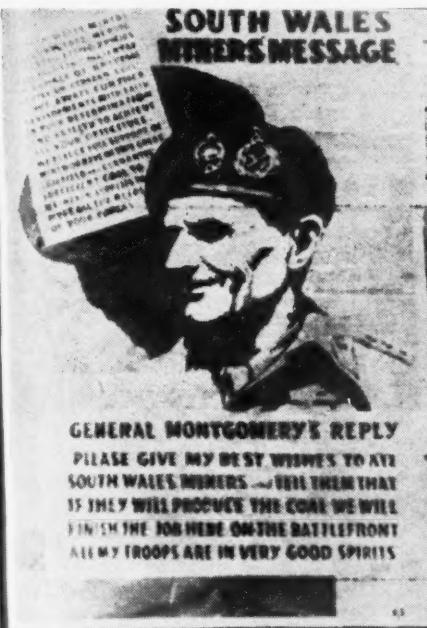
"Now thousands of youths will come to the mining industry for the first time. The wall between mining villages and the rest of the nation will be broken down. Men called up for mining will not go to the pits as soldiers. They will be civilian workers with exactly the same privileges and obligations as their fellow miners or men and women in war factories. They will be eligible for membership in the miners' trade union. They will be able to take their part in the work of pit-production committees and they will receive wages agreed on by the union. Twice they will be given free railway facilities to visit their homes and lodging allowance will be paid on the same scale as in other industries.

"Several government departments are

the level of other skilled workers, received substantial increases and they also won the award of a national minimum wage and the right to negotiate with the owners on a national basis and not on a basis of districts. In addition, national conciliation machinery representing miners and owners has been set up to deal with all disputes on a national basis.

"The Mineworkers' Federation at present is pressing for further wage increase. From now on miners will loom even larger in Britain's domestic life, for thousands of families hitherto outside mining problems will have a personal interest in the miner's well being.

"As Mr. Bevin told me: 'I realize that most of these lads I am having to send to the pits have been looking with great courage to the time when they will join the fighting services, and I am sure they



Monty greets Welsh miners: The Eighth Army's commander inspects a message from the Welsh miners and his reply at his field headquarters

now collaborating in providing necessary accommodations, either in billets, huts or hostels. Before going to the mines, the men will have four weeks' preliminary training in classes, with underground practice at special training centers. At the pits, they will work on the surface for a fortnight, and then, after a thorough medical examination, they will work underground under the personal supervision of skilled miners. When victory is won, men called up for the mines will have the same rights as men in the services in regard to demobilization and reinstatement in their old jobs. It is hoped, however, that many will then decide to make a career in the mines.

"The maintenance of Britain's coal production is going to be one of the more urgent matters in the postwar world. The country cannot afford to let manpower drift away as in the past nor can it lose the skilled craftsmanship of a miner. Some progress has already been made towards providing a foundation whereon a better mining industry can be built. Miners, whose pre-war wages left them far below

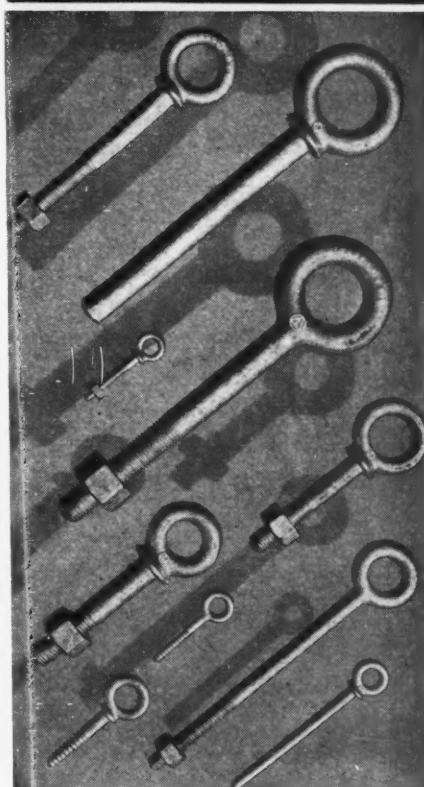
will understand that we would not have taken this course had it not been essential for the winning of the war."

"These boys, in the less spectacular life of the pits, will be playing as essential a part as a soldier, sailor or airman in the grim struggle which Mr. Bevin describes as 'the great effort of 1944 wherein coal will be one of the most vital things in our war effort.'

Francis Reelected Vice President A.M.C.

Reelection of all the present officers of the American Mining Congress resulted from the meeting of the board of directors, Dec. 15, New York City. Among these was James D. Francis, president, Island Creek Coal Co. who continues in office as vice president. Howard I. Young, president, American Zinc, Lead & Smelting Co. succeeds himself as president. With Mr. Francis are associated as vice

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EYE BOLTS
FOR ALL JOBS**



Keep your eye on this picture if you're thinking of having special bolts made up. Every minute counts! Laughlin standard eye bolts will likely fill the bill. All weldless — all drop forged steel. Nut type with extra length threads for extra adjustment. Send for latest Laughlin Catalog showing standard stock eye bolt sizes in nut, screw and rivet types.

Distributed through
Mill, Mine, and Oil Field Supply Houses

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Coal Mining Catalog

Write for latest Catalog on
Laughlin Industrial Hardware

FORGING A SHARE IN VICTORY

THE THOMAS LAUGHLIN Company
PORTLAND, MAINE



CRUSH and SAMPLE HALF A TON OF COAL . . .



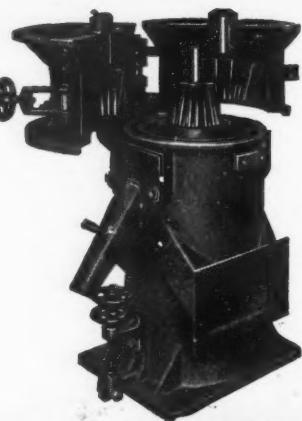
ELIMINATE
32 OPERATIONS
WITH THE
STURTEVANT
Automatic COAL CRUSHER
AND SAMPLER . . .

You can do a day's hand-work in MINUTES with this automatic Sturtevant equipment. The result—properly sampled coal for modern LABORATORY CONTROL so essential in the production of the CORRECT GRADE and BLEND of coal to meet the varied needs of power plants, gas plants, chemical, metallurgical, domestic and other users. By the Sturtevant method, you get truly representative samples (5, 10 or 15%) with no moisture loss. This is the equipment used by big modern collieries to reduce sampling costs, get better results and increase COAL SALES. The perfect combination of equipment should include the

STURTEVANT FINE GRINDER

in the Laboratory. This Sample Grinder is of the "open door" disc design. It produces results as fine as 100 mesh (coarser if wanted) working on dry, friable, soft or moderately hard materials. Handle regulates the output from 10 to 100 mesh. Will also crush hard rock and ore at reduced capacities. For details, ask for Bulletin 067.

• We make a wide line of Grinding, Separating, Elevating, Conveying and Mixing machines. Write for "pocket size" Bulletin covering the whole series.



THE QUICK
WAY TO GET
THE PROPER
BLEND
AND GRADE
OF COAL
TO
MEET YOUR
CUSTOMERS'
DEMANDS
AND INCREASE
SALES!



STURTEVANT MILL CO.
14 HARRISON SQ.,
BOSTON, MASS.

presidents Donald A. Callahan, president, Callahan Consolidated Mines Co. and Louis S. Cates, president, Phelps Dodge Corp. Julian D. Conover continues as secretary.

Grant Stauffer, president, Hume Sinclair Coal Co., succeeds himself on the board of directors with V. P. Geffine, James R. Hobbs, Neil W. Rice, Merrill E. Shoup and Howard I. Young. In place of John W. Haddock, president, Farrel-Birmingham Co., Inc., E. J. Burnell, vice president, Link-Belt Co., was elected to the board.

New Rating for Parts

The War Production Board assigned automatic AA-1 preference ratings Dec. 13 to the Foreign Economic Administration for repair parts needed to rebuild and recondition used construction equipment to be shaped overseas for use in strip mining. Automatic AA-1 ratings were also assigned for spare parts to be shipped with the equipment.

Repair and spare parts purchased under Directive I are exempted from the restrictions on sale and delivery established by Order L-192 (construction machinery).

Preparation Facilities

INDIAN HEAD COAL Co., Tremont, Pa.—Contract closed with Finch Mfg. Co. for five 4-ft. Menzies cones, three to clean No. 3 buckwheat, one to clean No. 4 and one to clean No. 5, each with feed capacity of 22 tons per hour; also one 8-ft. Menzies cone to clean No. 1 and 2 buckwheat, capacity, 70 tons per hour.

MILLWELL BREAKER, Millwell, Pa.—Contract closed with Finch Mfg. Co. for two 8-ft. Menzies cones, one to clean chestnut and pea and one to clean buckwheat, rice and barley. Total feed capacity for both units, 140 tons per hour.

SUSQUEHANNA COLLIERIES Co., Glen Lyon Colliery, Glen Lyon, Pa.—Contract closed with Wilmot Engineering Co. for two Type D jigs to prepare egg coal. Total feed capacity, 60 tons per hour.

WEST VIRGINIA COAL & COKE CORP.—Contract closed with Fairmont Machinery Co., Fairmont, W. Va., for cleaning plant at No. 5 mine, Omar, W. Va., 10 ft. diameter Chance sand flotation cone for cleaning $1\frac{1}{4}$; capacity, $11\frac{1}{4}$ tons per hour. Plant capacity, 168 tons per hour of $1\frac{1}{4}$ coal.

JONATHAN COAL MINING Co., Barton Plant, Dornsider, Pa.—Contract closed with Deister Concentrator Co. for one super-duty diagonal-deck table for treatment of No. 5 buckwheat.

COLYAR Co., Mt. Carmel, Pa.—Contract closed with Deister Concentrator Co. for one super-duty diagonal-deck No. 7 coal washing table for handling rice coal.

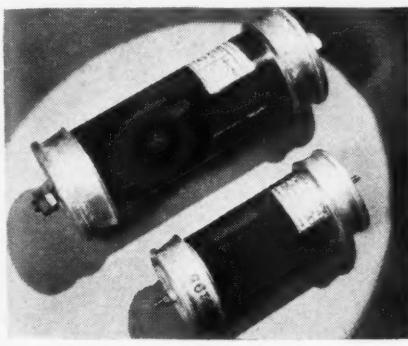
SANDY RUN MINERS & PRODUCERS Co., Upper Lehigh, Pa.—Contract closed with Deister Concentrator Co. for two super-duty diagonal-deck No. 7 coal washing tables for treating barley and No. 4 buckwheat.

TIPS FROM MANUFACTURERS

Capacitors

For high-voltage d.c. applications where space is limited, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., announces new solder-sealed porcelain-clad Type FPC Inerteen capacitors.

From 7,500 volts through the 200,000-volt class, the capacitor elements are hermetically sealed in a tubular wet-process porcelain body with solder-sealed end



closures. The end closures act as the capacitor terminal by connecting element leads at opposite ends, utilizing the porcelain tube as insulation.

By eliminating the large metal case and bushings required by metal-case capacitors, the new porcelain-clad capacitors help maintain minimum over-all dimensions, the manufacturer says. Larger types are furnished with or without cast mounting flanges. Where castings are used, the capacitors are solder-sealed, then castings are cemented on with mineral-lead compound.

Belt Repair

"Industrial So-Lo," a synthetic rubber product for repairing breaks, burned or worn spots; filling holes; and resurfacing industrial belts of all kinds—rubber, rubber composition, leather and cotton—is now being made with synthetic rubber. The manufacturer, So-Lo Works, Loveland, Ohio, asserts it will greatly lengthen the life of belts and permit continued use of some conveyor belts that might otherwise be discarded. It is easily applied, dries tough overnight and is economical, it is stated, and 1 qt. covers approximately 14 sq. ft.

Industrial So-Lo also is declared to be useful for resurfacing metal, wood and composition pulleys, to which it is stated it readily adheres, preventing slipping and cutting down wear. It safeguards workers

when used as an insulator to cover switch handles and other electrical devices and prevents slipping when applied to metal and concrete stair treads. This product is also used by industry and government in repairing rubber boots and gloves, the manufacturer points out.

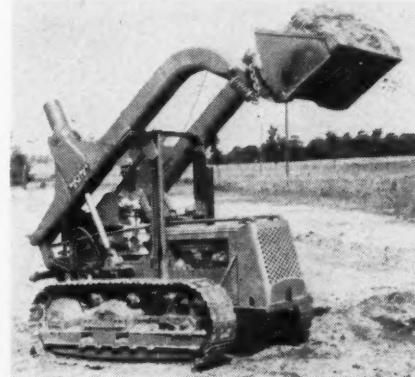
Dozershovel

Designed originally for the armed forces, the "Dozershovel," for T 9 and TD 9 International TracTracTors, has been offered for limited civilian sale under government release by Bucyrus-Erie Co., South Milwaukee, Wis. The company said that it is able to offer the Dozershovel because of production in excess of military demand.

Main feature of the Dozershovel is interchangeability between blade and bucket, with a third use as lifting crane through use of the standard hook on the upper edge of the bucket or blade.

The company says the unique design of the Dozershovel provides completely for full-fledged tractor-shovel and bulldozer service. As a shovel, the unit's hydraulic control provides down pressures up to 4,200 lb. The same control, the company says, provides easy penetration by the bulldozer unit in hard materials and ability to hold cut. The unit's dumping trip mechanism gives the dozer ability to tip the blade forward to release the load on uphill dozing. Changeover is accomplished from blade to bucket in the field in a few minutes by a few simple operations.

Bucyrus-Erie claims for the Dozershovel that it has visibility without blind spots which permits accurate dumping and reduces operator fatigue. Its travelling height of 8 ft. 1 1/2 in. allows it to work at close quarters and to be transported on trailers. Changeover requires these operations: removing five pins holding the bucket, trip latch and limit chains, setting dozer blade or shovel bucket in place, replacing pins.



Hydraulic Jacks

Templeton, Kenly & Co., Chicago, announces the addition of tandem-pump Simplex 30-ton and 50-ton hydraulic jacks to its line. The company formerly made jacks up to 20 tons.

These powerful hydraulics, the company says, have high and low speed pumps which can be operated singly or in unison. They are said to be sturdy, dependable and easy to operate. The base is made of special-analysis solid-steel bar stock which



adds to the load-bearing security. The jacks have two release valves located on opposite sides of the base. Either release screw controls ram return.

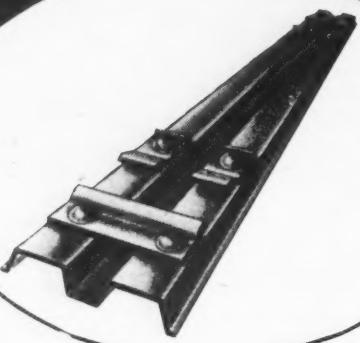
They come in Model 30HJ, 30 tons, 11-in. height, 7-in. hydraulic lift, weight 65 lb.; and Model 50HJ, 50 tons, 12-in. height, 7-in. hydraulic lift, weight 115 lb.

Electric Tachometer

A self-energized tachometer which can be used either as a hand type or separable type is announced by the Ideal Commutator Dresser Co., 1013 Park Ave., Sycamore, Ill. Essentially, the Ideal tachometer consists of a small generator coupled electrically to an electric meter.

The generator and meter are made as separate elements and coupled together

Coal Production Depends on Haulage...



...Haulage depends on Good Track!

To help you "keep 'em rolling" we can assure PROMPT DELIVERY on a number of standard track equipment replacement parts—among them the Steel Tie shown above.

The West Virginia Rail Company announces the change of its corporate name to West Virginia Steel and Manufacturing Company. Broadening our line of manufactured products has made this change in name advisable. Increasing facilities will enable us to give even better service. There has been no change of personnel and there will be no change in our policy of endeavoring to maintain the same intimate helpful relationship with our customers.

WEST VIRGINIA STEEL & MFG. COMPANY
Formerly The West Virginia Rail Company
HUNTINGTON  WEST VIRGINIA

by a precision-made bayonet lock. The units may be used together as a hand-type tachometer. Or for many applications, including permanent mounting, the generator and meter may be separated, "separable type," and connected only by a 2-conductor electric cord. A 5-ft. cord complete with coupling plug is provided but a cord up to several hundred feet long (of proper size wire) can be used without introducing any appreciable error in scale reading, the manufacturer states.

Size of the complete unit is $3 \times 7 \frac{1}{2} \times 2 \frac{1}{2}$ in., including $\frac{1}{2}$ -in. shaft extension. Weight is 3 lb. It is available in two sizes, 0 to 2,500 r.p.m., and 0 to 5,000 r.p.m.

Overlay Metal

A new overlay metal, "Kerk-Aloy," has been produced by the Kerk-Aloy Co., Hollywood, Calif., an affiliate of Kerkling & Co., Bloomington, Ind., and, according to the manufacturers, worn metal faces, edges and surfaces to which it has been applied regain their original efficiency.

The manufacturing process is secret, but the company states that under laboratory tests the metal has exhibited unusual qualities of hardness, resistance to wear, thermal conductivity, low melting point, stability of temper and ease of application. The metal will bind with any metal except lead and aluminum, the manufacturer says, and has been successfully used on many types of tool and machine metals. It is particularly adaptable as an overlay metal in abrasive work.

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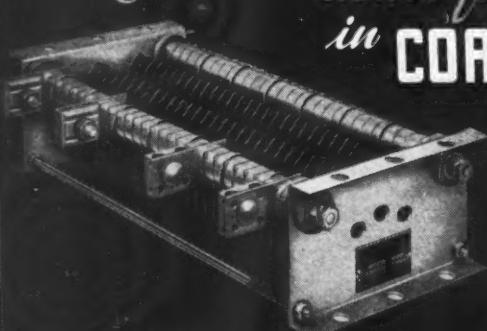
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P-G
The Unbreakable
STEEL GRID RESISTORS
for
HEAVY DUTY SERVICE
in COAL MINES



- ★ LOCOMOTIVES
- ★ MINING MACHINES
- ★ LOADERS
- ★ CONVEYORS



"The Resistor you can Install and Forget"

THE POST-GLOVER ELECTRIC COMPANY

ESTABLISHED 1892
221 WEST THIRD STREET, CINCINNATI, OHIO

Vacuum Switches

Four new vacuum switches for radio and industrial switching appliances have been announced by the tube division of General Electric Co.'s electronics department, Schenectady, N. Y. The manufacturer says they can also be adapted to oil- or water-immersed operation because of their inclosed construction and are especially applicable for hazardous installations where fire and explosion are a constant risk. Two of the new switches also are designed for high altitude applications.

Transformers

Eye appeal as well as functional advantages are two qualities claimed by the General Electric Co. for its new design of indoor dry-type transformers for primary circuits of 601 to 15,000 volts. The company says they also provide greater safety and ease of installation than previous dry-type designs and have the outward appearance of a room-type air-conditioning unit. The new design employs sheet steel with flowing lines, smoothly rounded corners and a two-tone gray finish.

According to the company's transformer engineers, weight of the material used for the new inclosing case is less than that for the old screened structure. In addition, the new case provides improved and directed circulation of the cooling air. Length of the transformers is about twice

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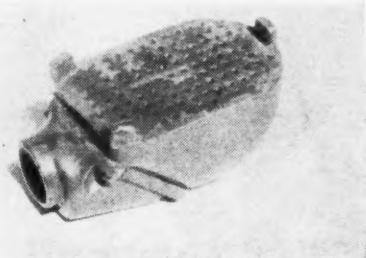
Bin-Level Indicator

Mosher Electronic Controls Systems, 130 West 42d St., New York, offer a dry-materials bin-level indicator operating entirely on the electronic principle.

The device has no moving parts and is said to be effective in measuring all types of material whether fine or coarse. The maker says it gives a positive check on shipping and storage operations and is easy to install. It consists of two parts, a detector box which is attached to a probe extending into the bin, and a signal control, which is attached to a series of colored lights showing when the bin is full, empty, etc. Hook-up with sound makers, valve cut-offs or remote signal devices can be arranged.

Foot Valve-Strainer

A new combination foot valve and strainer for mine gathering pumps is now offered by the Guyan Machinery Co., Logan, W. Va. The company describes the unit, for which a patent has been applied for, as "the answer to a long-felt



need of the mine operator for such an improved accessory to his pumping equipment. The straining surface is approximately double the area of pipe for which the device is tapped."

New Power Plant

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has designed a complete 5000 kw central station, completely assembled to make a railroad train of eight cars. The company says the needs of modern warfare were responsible for the new design, and that it is constructed to use coal of unusually low quality and will work where temperatures range from 110 degrees above zero F. to 40 degrees below. The plant can be hauled by locomotive to any spot where rail tracks exist and deliver power in about 48 hours.

The first two cars carry the air-cooled condensers, the third, the turbine generator, the fourth and fifth, auxiliary equipment and water storage; six and seven, the

GRUENDLER CRAFTSMANSHIP...
Employed by Coal Producers

SPECIFIC SIZES of COAL

LUMP, EGG, NUT or STOKER SIZES produced with a minimum of
fines, using low power by the GRUENDLER CRUSHER method.

Patented...
TWO-PIECE HAMMERS or
RING HAMMERS

Ring Hammer

Two-Piece Hammer

GRUENDLER ST. LOUIS, MO.

A crusher utilizing
small space and accomplishing new highs
in coal production.
GRUENDLER builds a complete line of coal
crushing equipment includes both single and
double roll crushers. Bulletins sent on request.

GRUENDLER
CRUSHER and PULVERIZER Company
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for
transmitting
large powers
continuously

select

DE LAVAL WORM GEARS

The case hardened steel worms, bearing-bronze wheels, and copious lubrication give long life, without requiring attention other than occasional checking of oil level. The efficiency is high, reaching 97 per cent for certain ratios, and does not recede, but rather improves, with use. The transmission of power is shockless and noiseless.

Our engineers gladly supply data and give competent advice for the solution of speed transformer problems. Ask for Leaflet W-1128

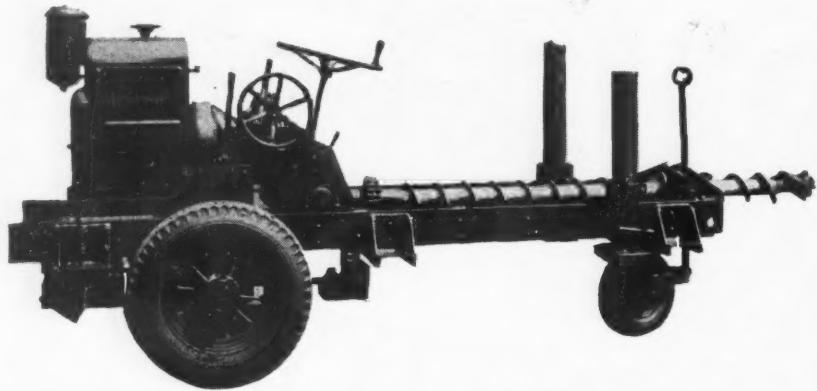
DE LAVAL **WORM GEAR DIVISION**
of the De Laval Steam Turbine Co., Trenton, N. J.

MANUFACTURERS OF TURBINES STEAM HYDRAULIC PUMPS CENTRIFUGAL PROPELLER ROTARY DISPLACEMENT MOTOR-MOUNTED MIXED FLOW GLOOSES SELF-PRIMING CENTRIFUGAL BLOWERS AND COMPRESSORS GEARS WORM HELICAL AND FLAT-FLAT COUPLINGS

PARMANCO Horizontal Drills

"Positive Control Drilling"

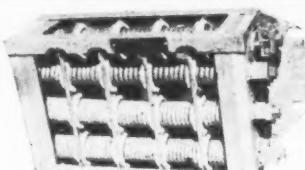
Parmanco Horizontal Drills give you "Positive Control Drilling." Parmanco Vertical and Horizontal Drills are today's leaders in low cost, low maintenance drilling—All Parmanco Drills are equipped with patented Parmanco augers. Used by leading strip mine operators—Write us your drilling problems.



PARIS MANUFACTURING CO.
PARIS, ILLINOIS



MAINTENANCE IS EASY ON
G. M. C.
RESISTANCE



DISTRIBUTORS

Mill & Mine Supply Co., Birmingham, Ala.
Close Distributing Co., Pittsburgh, Pa.
W. M. Hales Co. Danville, Ill.
Chicago, Ill.
Benton, Ill.
Hillsboro, Ill.
Orville Phipps Denver, Colorado
Wilkes-Barre Equipment Co.,
Wilkes-Barre, Penna.
Mechanical Mining Service,
Wheeling and Morgantown, W. Va.
Rogan & Rogan Co. Middlesboro, Ky.

Although these coils are fully enclosed—light weight—and come as a complete unit for quick installation they are particularly easy to maintain. An individual coil may be replaced by merely removing nuts from each end of the case and pulling the coil out without disturbing any other part of the unit.

This is of particular importance now when it is essential that you keep your present equipment going all of the time.

For ease of installation—longer life—and easy, quick maintenance of your mining machinery use G. M. C. Resistances. Full particulars in G. M. C. resistance booklet. Write for one.

GUYAN MACHINERY COMPANY
LOGAN, WEST VIRGINIA

boilers, and eighth, the crew's quarters and spare parts.

The boilers produce steam at 600 pounds gage, 750 degrees F. The single turbine-generator unit delivers to the bus 6250 kva at 80 percent power, 6300 volts.

The company says that while the unit was designed primarily to furnish power in devastated regions during the war, it can be used in peacetime for emergencies such as floods.

Chain Repair Links

Two types of a new dragline chain repair link are being marketed by the American Manganese Steel Division, American Brake Shoe Co., Chicago Heights, Ill., following the issuance of a United States patent on the device to John O'Fallon Clark. The company states



the new replacement links enable quick repairs on the job and insure a tightly held bucket-chain joint.

For larger chain, 14- to 21-in. section, having the longer pitch lengths, type M-91 is recommended. The halves, with interlocking lugs, are secured by four rivets to produce a tight joint.

For smaller chain, 7- to 18-in., the R-890 type is stated to be more adaptable. In it, tapering ends fit closely into grooves



in the opposing half link and the two halves are joined together by a single rivet through the joined center lugs. The center bar or stud prevents kinking that might lead to destructive jerks in operating.

New Air Blaster

The Chelsea Fan & Blower Co., Inc., Irvington, N. J., at the first of this year marketed a new product known as the air blaster, main feature of which, the maker says, is that it delivers a large volume of air in a straight line to the spot where it is needed, reaching more effectively into out-of-the-way corners and dead air spaces. The air stream continues at high velocity over large distances and expands only slightly.

The unit is made in three sizes, 18 in., $\frac{3}{4}$ hp, 6000 cfm motor; 24 in., $1\frac{1}{2}$ hp, 9000 cfm motor, and 30 in., $1\frac{1}{2}$ hp, 11,000 cfm motor. It is driven by a direct

connected ball bearing motor and the adjustable pedestal may be tilted 60 degrees up or down.

Trade Literature

TIMBER CONNECTORS—Timber Engineering Co., Washington, D. C., has prepared a 40-page "Design Manual for Teco Timber Connector Construction." The manual, the company says, offers complete design information covering the use of connectors, including data on load value, spacings, etc. The material is presented in chart form and includes information on recommended cambers for standard trusses, approximate weights of various timber roof trusses and a table of dimensional properties of American standard-sized lumber. The data is in accordance with WPB specifications.

WELDING HELP—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., offers an illustrated wall chart showing 14 causes and cures of common welding troubles. Among those listed are cracked welds, distortion, brittle joints, undercut, welding stresses, magnetic arc blow, irregular weld quality, corrosion, warping (thin plates), porous welds, spatter, poor fusion, poor surface appearance and incomplete penetration.

ENGINEERING REPORTS—The Alexander Hamilton Institute has added to its free list a booklet entitled "How to Prepare an Engineering Report." The institute says the volume assists in putting facts, findings and conclusions into convincing form to supply information or secure action. It is available from the institute at Department CA, 71 West 23d St., New York 10.

PYROMETER MANUAL—The Bristol Co., Waterbury 91, Conn., has issued Bulletin P1211, a pyrometer accessory manual giving engineering data on the selection and installation of thermocouples, protection wells and lead wire; thermocouple and protection well assemblies; and calibration data and tables.

PACKING—A guide on the selection of packing has been issued by Greene, Tweed & Co., Bronx Blvd. and 238th St., New York 66, N. Y. The bulletin tabulates more than three dozen different fluids handled in process work and general plant services and lists the correct packing for each liquid, gas and vapor. It also lists the form and construction of each packing and the typical equipment for which it is suited.

MATERIALS HANDLING—A large, profusely illustrated booklet, "Modern Materials Handling Machinery Applied to American Industry," has been issued by the Yale & Towne Mfg. Co., Philadelphia 24, Pa. The booklet is designed to give practical functional demonstrations of materials handling machinery. It contains information on recommended handling practices with the manufacturer's machinery and application pictures showing the equipment in use.

IGNITRON RECTIFIERS—General Electric Co., Schenectady, N. Y., offers booklet

Can You Afford to Specify Anything but Promet?

*It's Surprising How
THE RIGHT BEARINGS
AND BUSHINGS
Cut Down Maintenance Cost!*



Guaranteed to give service superior to any other bearing metal, or your purchase price, including freight, will be refunded.

Specializing in Bronze Bearings and Bushings for Coal Mining Equipment.

Specific formulae designed to Pioneers in Superior High best serve each requirement. Lead Bronzes and Alloys.

Parts for Jeffrey, Goodman, Westinghouse, General Electric, Sullivan, Joy Equipment, etc.

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Prompt deliveries can usually be made from stocks maintained at
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This low resistance is guaranteed for the following reasons:

- Perfected Manufacturing Process
- Maximum Cable Conductivity
- Oversize Terminals
- Oversize Area for Welding to Rail
- Simplified Welding with Steel Terminal, Steel Rail and Steel Welding Rod.

Write for complete information today.

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TYPE MB-F
Rail Bond



**VERY Close
Tolerances**

• We satisfy NEMA standards in the Superior line as a whole. In some cases, however, tolerances of .0005 must be observed. Since carbon is too hard to be machined, every Superior Carbon Brush is ground to size with carborundum stone. In grinding, as in all other essential respects, Superior facilities are adequate. Write for Bulletin No. 7.

**SUPERIOR CARBON
PRODUCTS, INC.**

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**SUPERIOR CARBON
BRUSHES**



All ambitious production men who are genuinely interested in self-improvement—in preparing for the future—are invited to send for "Forging Ahead in Business." This valuable booklet outlines the Institute's time-tested training plan. It was prepared by the Staff in cooperation with prominent industrialists.

"How to Prepare an Engineering Report," a helpful 72-page guide ordinarily available only to subscribers, will be sent with "Forging Ahead in Business" while the supply lasts.

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Please mail me a copy of the 64-page book—"FORGING AHEAD IN BUSINESS," and also a copy of "HOW TO PREPARE AN ENGINEERING REPORT," both without cost.

Name.....
Business Address.....

GEA-3706, a 36-page publication dealing with Ignitron mercury-arc rectifiers for 501-kw. and higher ratings, 250 to 900 volts. The booklet lists advantages of rectifiers in converting alternating to direct current in mines and stresses what the manufacturer says is their easy installation, quick starting, quiet operation and low operating and maintenance costs. Part of the publication outlines the design and mechanical construction of the rectifiers.

PUMPS—A catalog on Rex Speed Prime Pumps has been issued by the Chain Belt Co., 1600 West Bruce St., Milwaukee, Wis., giving specifications and capacity charts to aid in pump selection. The pumps are made in capacities from 3,000 to 125,000 g.p.h. and are primarily for dewatering purposes. The bulletin outlines their construction and performance.

TRACK SUPPLIES—Publication of a 16-page bulletin presenting all the major track accessories required for coal mine haulage is announced by L. B. Foster Co., Box 1647, Pittsburgh, Pa. The manufacturer says the booklet is a reliable guide and time saver for selection of items needed on mine trackage.

MAINTENANCE—Allis-Chalmers, Milwaukee, Wis., has changed the name of its "Victory Production and Maintenance News" to "Allis-Chalmers Operation and Maintenance Review" and will issue the publication bi-monthly. The booklet contains maintenance tips and articles on current trends for shopman and executive.

POWER DISTRIBUTION—A bulletin entitled "Packaging Pays Off" has been issued by Allis-Chalmers, Milwaukee, Wis., describing standardized load center unit substations of 100 to 2000 kva capacity for meeting power supply needs. The manufacturer says the most unique feature of the bulletin is a simple nomogram which makes it possible to select the correct air circuit breaker for any application of a standardized load center unit substation.

BELT DRIVES—The American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, presents a handbook on the automatic belt tension control feature of its "economatic" drives. The maker explains that the booklet shows how the drive helps to increase machine production through eliminating belt slip, increasing belt and bearing life and reducing drive maintenance.

BULLDOZERS—Condensed catalog 839, issued by the Baker Mfg. Co., Springfield, Ill., shows the company's line of hydraulic bulldozers and gradebuilders as standardized on a wartime basis. Two types of moldboards for hydraulic bulldozers have been combined into a single moldboard to combine all functions. Gradebuilders for crawler tractors are available in essentially the same models as in the past.

DIESEL LOCOMOTIVES—General Electric has made available a 15-page booklet on diesel-electric industrial locomotives which describes its 50 ton, 2-axle, 300 hp model.

ELECTRIC HEATERS—Bulletin 65, Elec-

tric Air Heater Co., division of American Foundry Equipment Co., 555 South Brykit St., Mishawaka, Ind., describes two new models of electromode industrial unit heaters. The booklet says the units are designed for heating isolated spaces where intermittent and high efficiency is desired. They are available in portable or suspension models in capacities providing from 5,112 to 204,900 B.t.u.

ADJUSTABLE SPEED—A 40-page bulletin by General Electric Co., Schenectady, N. Y., describes the "Thy-mo-trol," an electronic drive for controlling adjustable voltage power from a.c. lines. The first section of the bulletin describes Thy-mo-trol drive in details, its functions and advantages. Typical applications are listed. The second section explains the drive's operation.

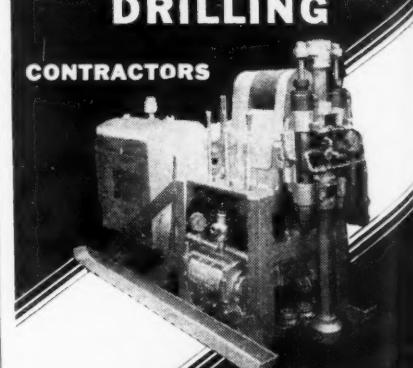
Rail & River Plans

John T. Sydnor, president and general manager, Rail & River Coal Co., Bellaire, Ohio, announced last month that a program for improvement of the company's properties would include sinking a new slope for escapement purposes at Barberville, Ohio, construction of a wash house and central shop and consolidation of the output of Mines No. 3 and 4. More improvements are scheduled, Mr. Sydnor said, and will be started later this year.

MOTT

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CONTRACTORS



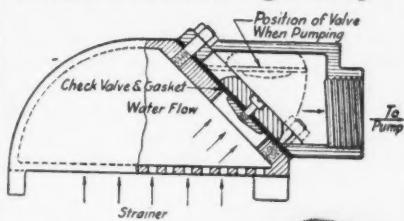
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using our light gasoline drills. They save
fuel and moving costs... guarantee satis-
factory and proper cores.

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our stop grout method. Water wells and
discharge holes drilled and grouted...
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• A device that answers a long-felt need of Mine Operators! This improved accessory to pumping equipment offers a straining surface that approximately doubles the area of pipe for which the device is tapped. Write for details today! Complete information on request.

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• Designed to meet demand for an automatic cage to complete a faster hoisting cycle as the result of over sixty years' experience manufacturing cages in the coal mining field. In addition to Self-Dumping Cages which hold the world's record for capacity, special types are furnished to fit individual needs. Write for information on Olson Non-Dumping Platform Cages or other material cages for use in air shafts.

Inquire about the small, low-cost Eagle Crusher

Eagle IRON WORKS
DES MOINES, IOWA
Established 1872

COAL AGE • January, 1944

Obituary

DAVID B. PIERSEN, chairman of the board of Stephens-Adamson Mfg. Co., Aurora, Ill., died Nov. 29 at the age of 63. He had been with the company since its start in 1900 and served as sales manager, secretary and vice-president. He was elected president of the company in 1914 and served until 1934, when he became chairman of the board.

D. J. SHELTON, 57, president and general manager of the Marion Steam Shovel Co., Marion, Ohio, died at his home Nov. 27 after a brief illness. Mr. Shelton started with the Marion company in 1909 as a shop maintenance man and rose to the presidency of the organization in 1941. He was a graduate of Ohio University, Athens, Ohio.

WILLIAM G. IRWIN, 77, founder and chairman of the board of the Cummins Engine Co., Columbus, Ind., died Dec. 14 in Indianapolis of a heart ailment. Mr. Irwin was president of the Indiana National Bank, the state's largest, and he also headed the Irwin-Union Trust Co. and the Union Starch & Refining Co. He was a former director of the United States Chamber of Commerce, a member of the Republican National Committee from 1938 through 1940, and a delegate to the Republican national conventions in 1916, 1936 and 1940.

Industrial Notes

ASBESTOS FIBRE SPINNING Co., North Wales, Pa., has been purchased by Greene, Tweed & Co., New York, manufacturers of Palmetto and other self-lubricating mechanical packings and also various mill supply specialties.

WEST VIRGINIA RAIL Co., Huntington, W. Va., has been reincorporated as the West Virginia Steel & Mfg. Co., according to an announcement last month by B. E. Schonthal, vice-president. Mr. Schonthal explained the change was made to include in the company name the other products which it now produces.

WICKWIRE SPENCER STEEL Co., New York, has appointed Robert T. Dunlap as general superintendent of its Buffalo, N. Y., plant, succeeding William A. Steele, resigned. Prior to joining Wickwire, where he was assistant to the president, Mr. Dunlap was associated with the Vulcan Iron Works, Wilkes-Barre, Pa.; Elliott Co., Jeanette, Pa.; Jones & Laughlin Steel Corp., Pittsburgh; and the Pittsburgh Bridge & Iron Works.

WESTINGHOUSE ELECTRIC & MFG. Co., East Pittsburgh, Pa., reports that G. J. Stegemerten, staff supervisor of industrial methods engineering, has joined the staff of the Secretary of War as expert consultant. His duties will cover special assignments involving ordnance plants and arsenals. Mr. Stegemerten has been with Westinghouse since 1909.

THE FALK CORP., Milwaukee, Wis., has announced the appointment of Thomas F.



HAVE I TOLD YOU ABOUT MY OPERATION?

If Wilmot "Hydrotator" Coal Cleaning Units could speak, they would brag about their super-efficient operation, for this famous coal cleaning method, manufactured exclusively by Wilmot, meets every requirement for cleaning war-vital coal better and faster.—Wilmot Engineering Company, Hazleton, Pa.



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THE COAL INDUSTRY
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Hercules Augers

Ideal for modern high speed electric drills—withstanding whips and torsional strains. Drill hard and tough as whalebone. Drill faster—drills more holes with resharpening—outlasts four to five ordinary drills. Recommended for the hardest jobs. Up to 3" diameters—up to 16 ft. in length.

Black Diamond Augers

Carefully made from high-carbon crucible grade steel—heat-treated to obtain as much hardness and toughness as possible, to prevent broken tangs and points. Furnished up to 2" diameters—maximum over-all lengths 16 ft.

Standard Augers

Originally developed for use with hand drills. These augers work best at hand drilling drilling holes under stumps, and ditch blasting. Up to 2" diameters from oval steel, $7/16$ " thick, and maximum length of ten ft.

Call on us for any type auger you may require in your operations. We specialize in manufacturing the better grade alloy, heat-treated augers. Write, wire or phone for details concerning sizes, prices, deliveries, etc.

SALEM TOOL COMPANY
SALEM OHIO

Scannell as general sales manager, effective Dec. 15. Mr. Scannell has hitherto been in charge of all sales except foundry division products. A graduate of Yale University, Mr. Scannell has been with Falk since 1928. At the same time, the company announced that John S. Wilkinson would be assistant sales manager in charge of foundry sales.

FAIRBANKS, MORSE & Co., Chicago, recently announced five changes in its personnel. O. O. Lewis, former branch manager at Atlanta, Ga., has been promoted to assistant general sales manager. V. O. Harkness, former Dallas, Tex., branch manager, has been named manager of the diesel engine sales division. H. J. Renken, oil field division manager at Dallas, becomes branch house manager there, continuing to serve also as oil field manager. J. S. Peterson, former manager of the scale department at Cincinnati, Ohio, has been made Cincinnati branch manager, and G. N. Van Epps, manager of the diesel department at Chicago, steps up to branch manager at Atlanta.

KOEHRING Co., Milwaukee, Wis., received the Army-Navy "E" award at a ceremony held at the plant Dec. 12.

E. I. duPONT de NEMOURS & Co., Wilmington, Del., announced the retirement on Dec. 15 of Francis J. Byrne, assistant

director of public relations. He was associated with the company for 27 years following many years experience in newspaper and business publication fields.

AMERICAN CAR & FOUNDRY Co., New York, has announced election of four vice-presidents, A. A. Borgading, E. D. Campbell, J. A. V. Scheckenbach and E. A. Williams. Mr. Borgading was formerly purchasing agent and has been with the company since 1907. Mr. Campbell, with the company since his graduation from Pennsylvania State College in 1903, was formerly general mechanical engineer. With the company since 1909, Mr. Scheckenbach was promoted from construction and improvement engineer, and Mr. Williams, who joined A. C. F. in 1924, was district sales manager in Cleveland. A.C.F. also announced two changes in its sales staff. Dudley L. O'Brien, former sales agent at Cleveland, becomes district manager of that office, succeeding R. A. Williams, who moves to the New York office. A. G. Wood was named district sales manager at Washington, moving from the Chicago office, where he was sales agent.

JOHN A. ROEBLING'S SONS Co., Trenton, N. J., has announced two promotions in its sales department. Stuart E. Yeaton, formerly manager of sales of round, flat wire and specialties, has been made man-

ager of sales of electrical wire and cable division. He joined the company in 1934 after his graduation from the University of Washington. G. K. Hayes has been made assistant manager of the company's Cleveland branch, where he was formerly a salesman. He joined the company in 1930 and is a graduate of West Virginia University.

UNITED STATES RUBBER Co., New York, has assigned two men to new positions with the wire and cable department. Harold J. MacDonald, eastern district sales manager, becomes manager of jobbing sales, and Howard F. Johnson, western district sales manager, becomes manager of branch sales. Mr. MacDonald has been with U. S. since 1920 and Mr. Johnson since 1922.

TEMPLETON, KENLY & Co., Chicago, has appointed A. C. Lewis vice-president in charge of sales, effective Jan. 1. Mr. Lewis joined the company in 1912 and was wounded in World War I while serving with the Canadian Army. In 1915 he formed his own Canadian company as an outlet for simplex jacks. Most recently he was special sales representative for the company in Canada.

PITTSBURGH PLATE GLASS Co., Pittsburgh, has announced these changes in personnel, effective Jan. 1: Clarence M. Brown has resigned as chairman of the board but will remain as chairman of the finance committee. Harry S. Wherrett, vice-chairman, becomes board chairman, Robert L. Clause, president, becomes vice-chairman of the board, and Harry B. Higgins, executive-vice-president, will become president.

KOEHRING Co., Milwaukee, Wis., has announced personnel changes affecting the company and its subsidiaries. J. R. Steelman, vice-president, has assumed charge of sales of all companies, with George J. Dimond in charge of Koehring sales; A. E. Kelbe in charge of Kwik-Mix Concrete Mixer Co. sales; H. J. Holdsworth in charge of Parsons Co. sales, and J. F. Robbins in charge of C. S. Johnson Co. sales.

WICKWIRE SPENCER STEEL Co., New York, has announced the election of Samuel D. Lunt to the board of directors, replacing Charles G. Terry. Mr. Lunt is the managing partner of Hamlin & Lunt, Buffalo, N. Y., stock brokers.

TIMKEN ROLLER BEARING Co., Canton, Ohio, has made Paul Reeves its advertising manager to succeed Roland P. Kelley, resigned. Mr. Reeves has been with Timken since 1929, his latest assignment being the handling of government priorities.

TIMKEN ROLLER BEARING Co., Canton, Ohio, announced last month that Peninsular Steel Co., Cleveland, would expand its activity in Ohio for the sale of graphitic tool steels to include Dayton and Cincinnati. Timken also announced the appointment of Ralph L. Wilson as chief metallurgical engineer. He had formerly been chief of the constructional steels section, metallurgical and conservation branch, Steel Division, War Production Board, and for ten years before that was with Timken.

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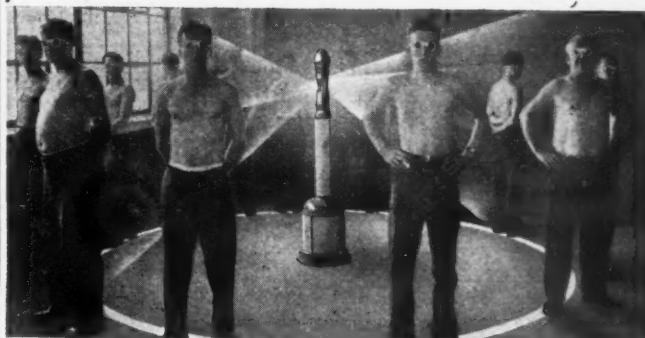
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*The New Highly Efficient Aid
For the
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Hanovia—the world's largest manufacturer of Ultra-violet equipment offers mine operators the new Lighthouse to help workers keep physically fit.

It is universally recognized that "sunshine" is essential to health and that the most vital elements in it are the "actinic ultraviolet rays"—such as produced by Hanovia's LIGHTHOUSE.

This LIGHTHOUSE has been created for the ultraviolet irradiations of groups of persons. It has been designed to stand upon the floor in the center of an area about twelve feet in diameter. Employees can walk or stand about the lamp at an average distance of five feet. Fifteen persons can be accommodated at one time at five feet distance.

The ultraviolet application involves only a few minutes

The LIGHTHOUSE is sturdily built, easy and economical to install, maintain and operate.

Many large mines—here and abroad—are using ultraviolet lamps with remarkable results. The experience of the famous Boliden Copper Mines in Sweden is worth noting. Dr. Johan Ponten, an eminent Swedish physician, makes this statement concerning the results obtained from Hanovia Ultraviolet Group Lamps.

"The reduction of absences due to illness (not including accidents) amounts to 120 days per annum for each 100 workers. In addition to this, one-day absences diminished by 12%. In all, these mines gained 134 additional working days from each 100 workers during the year in spite of the fact that figures of absence due to illness had previously shown a general trend towards increase during three years."

The ultraviolet baths are beneficial to the miners and also the industry itself.

We urge mine operators to investigate Hanovia's Lighthouse.

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STANDARD Ahlberg **CJB**
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suit practically all applica-
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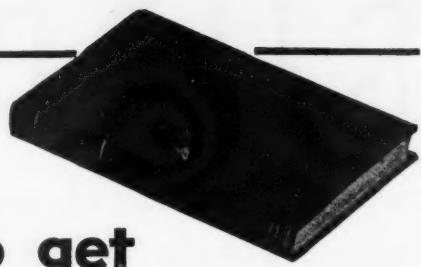
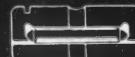
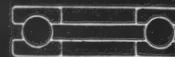
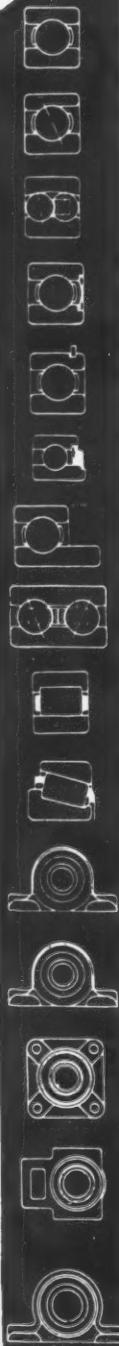
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THIS practical manual thoroughly discusses the various types of equipment used in slope-sinking, entry-driving and development work, and in production of coal from the usual or regular working sections—details the methods suited to or used with the various types of equipment and under various seam thicknesses and natural conditions—tells how machines are best installed, where they can fill in for other types of equipment, what to do to get biggest production from equipment.

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- methods for increasing mining extraction etc., etc.

CONTENTS

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2. Mechanical - Coal - loading Essentials
3. Types of Mechanical-loading Units, Characteristics, Crews, Unit production—Hand-loaded Equipment
4. Types of Mechanical-loading Units, Characteristics, Crews, Unit Production—Self-loading Equipment
5. Slope-sinking and Development with Mechanical-loading Equipment
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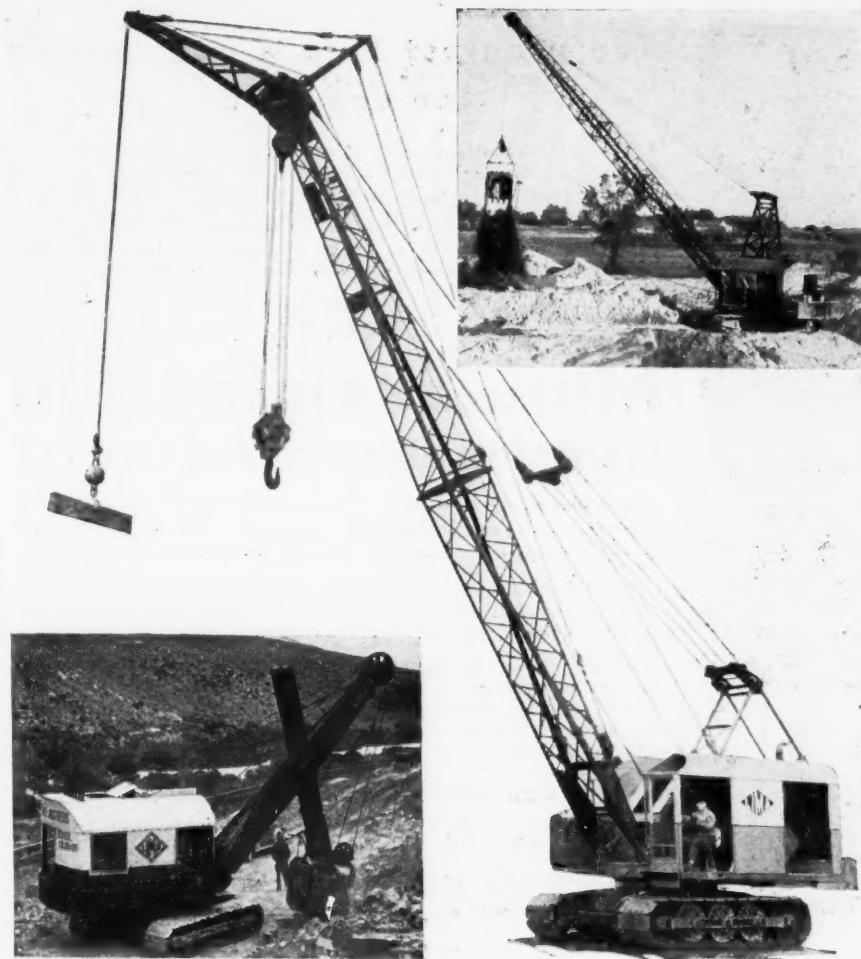
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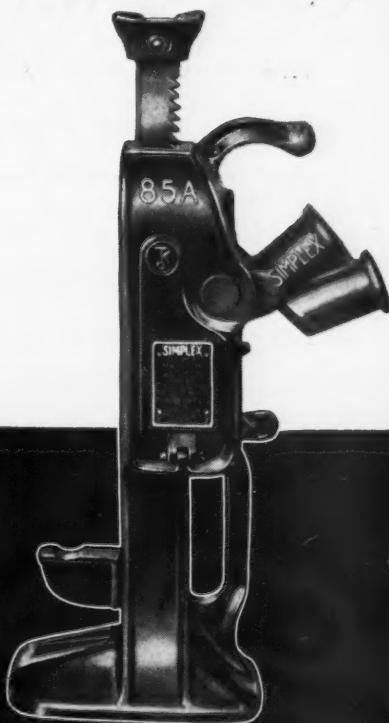
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A size for seams of any thickness:

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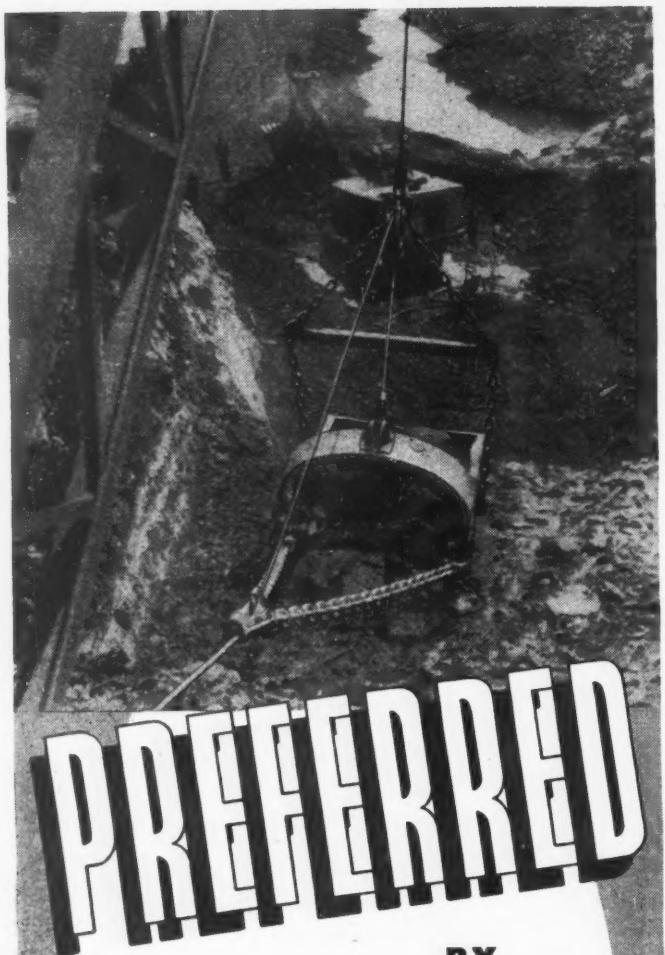


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Dragline Buckets dig—through
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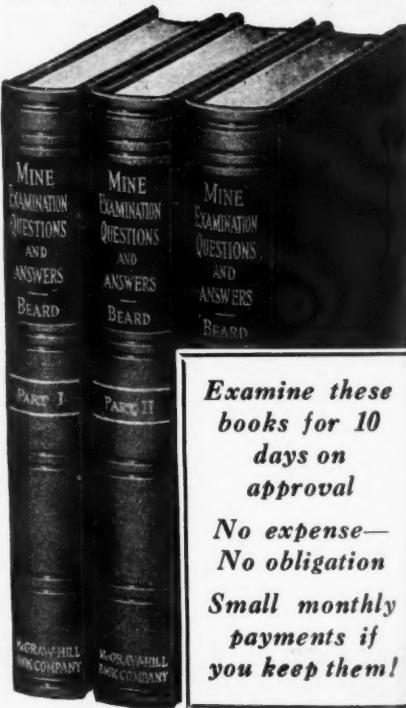
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In what time can an engine of 40 effective hp. pump 4,000 cu. ft. of water from a shaft 360 feet deep?

What are the advantages and disadvantages of a gasoline pump, an air pump and an electrical pump?

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EVERY TYPE of Rotary

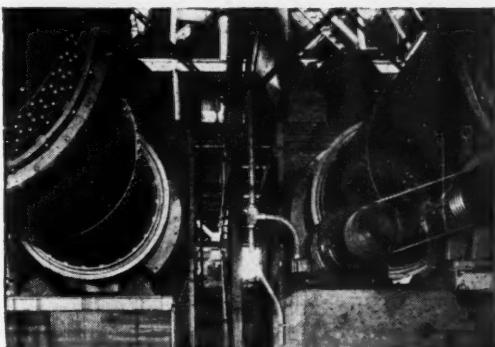
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Consists of a series of steam tubes within the drum upon which the material rests. Moisture being removed without appreciable dust loss.

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APCO TURBINE-
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Silent, compact and lasting.



APCO Single Stage Turbine-Type

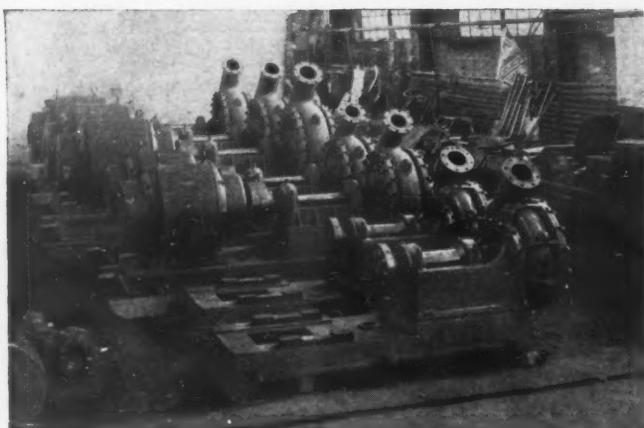


APCO Horiz. Condensation Return Unit

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92 Loucks Street, AURORA, ILLINOIS

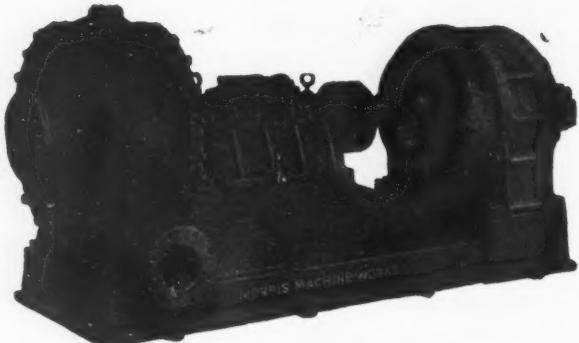


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This battery of MORRIS Slurry Pumps is part of an order for more than 150 units, ranging in size from 1½ in. to 10 in., to be used in producing aluminum.

The requirements for these pumps are severe, for the design must provide constant expulsion of entrained air, the construction must withstand the chemical and physical action of alumina slurry, and the service involves foaming slurry which is difficult to handle.

However, MORRIS Pumps are accustomed to meeting difficult requirements. For 80 years, MORRIS has specialized on the "hard-to-handle" services . . . slurry, sludges, sand and gravel, sewage, paper pulp, chemicals, etc. This experience is at your service . . . to help solve your liquid-pumping problems. The MORRIS engineers are prepared to offer their authoritative advice without obligation, and invite your inquiry.



Morris Heavy Duty Material - Handling Pump

MORRIS MACHINE WORKS

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NEW YORK



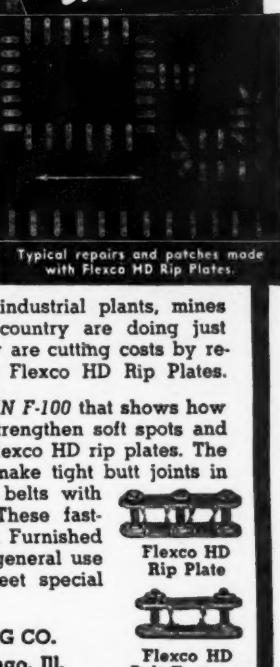
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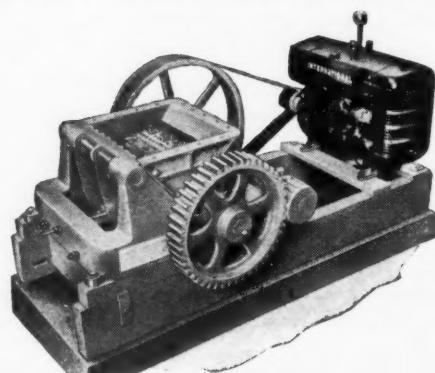


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REG. U. S. PAT. OFFICE
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WANTED TO BUY, 2 Armatures for Type 2600 R Goodman Locomotive, 250 Volts D.C. No. 40485. W-243, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

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CONTRACTORS WANTED to Bid on uncovering coal strip mine-average 20 ft. overburden, soft shale with dragline not less than 5-yard. Arkansas location. Write BO-244, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

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FOR SALE: TWO TRACK TIPPLE, complete with Morrow Conveyor, Jeffrey Crusher and Shaker Screen. Bolted timber structure one year old, easy to take down and reassemble on new site. Switches and trackage for 1,000-ton-a-day loading. Ties one year old. See Mr. Brown, The C. and M. Coal Company, Salineville, Ohio or call Mr. Poole evenings at 51 Amsterdam, Ohio.

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On outright purchase or royalty basis, or will strip in contract. Should contain 1,000,000 tons coal or more. Overburden should not exceed about 30 to 35 feet. State location, kind of coal, thickness of vein, average depth and nature of overburden (whether rock layers or not), kind of roads, hauling distance, name of railroad. Will sell coal myself or owner can sell. Can produce about 2500 tons coal per day. Address reply to

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2,000,000 yds. Dirt Per Season?

65' deep. Coal stripping. Long term contract if desired.

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Koehring 1 1/4 yd. Dragline, 100' bm.
Caterpillar D7 Tractor with bulldozer.

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Buc. Erie Steam Crane, Model 30B, 40' bm.
Buc. Erie 41B Steam Shovel and Crane
Moore Speedcrane 15 tons, gas, 63' boom
Northwest Model 105 Gas Shovel, 1 yd.
Lorain 75B Gas Shovel, 1 1/2 yds.
Marion Model 32 Steam Shovel, 1 1/2 yds.
Ind. Brownholst Crane, gas, 40' boom 1 yd.
Brownholst Loco. Crane 35 tons, steam
2—Mack Trucks 6BX, Boulder Type, 12 yds.
3—Sterling Trucks 170-C, Boulder Type, 12 yds.
Allis Chalmers "L" Tractor with bulldozer
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Power, Distribution & Current Transformers
150—5 Ampere, 110 Volt, 2 Wire Meters
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1—24 Circuit Control Breaker Panel

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Browning 25 ton Steam Locomotive
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All in excellent condition

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Davenport 19-ton locomotives, std., 36" ga. (2).
Porter 18-ton locomotive, steam, 36" gauge.
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(Above locomotives 100% rebuilt, tested).
Plymouth 25-ton gas locomotive, std. ga.
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Portable 24" ga. track, 1900'; 14—dump cars; 2—
7-ton gas locomotives.

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8—Allis Chalmers Speed-Ace
TRACTOR WAGONS
7 1/2-yd. cap. In good condition
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1—10-ton Goodman, type 34-B, 250 volt ball bearing motors.
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The above locomotives can be inspected at our shop. They have all been completely rebuilt and guaranteed 100% against electrical or mechanical defects.

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1—200 KW Chase 4-valve, non-releasing General Electric Engine Generator Set, 250 volt DC.
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18,000 linear feet 30-lb. per yard
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Splice Bars to match. Everything for railroad tracks.

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FOR SALE Fairbanks Morse Railroad Track Scale

\$5,500.00—Like new
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1 Jeffrey Armature, Catalog No. 99741.
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Draglines—1 1/2 to 6 yards.

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Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
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—	25 "	16.00
2"	50 "	23.00
—	25 "	13.00
1 1/2"	50 "	20.00
—	25 "	11.00

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SPECIAL OFFER...HEAVY DUTY RUBBER HOSE

I.D. Size	Length	Couplings
1/4"	25 feet	\$4.25
1"	50 "	8.00
1 1/4"	50 "	6.25
1 1/2"	25 "	12.00
—	35 "	7.50
—	40 "	10.50
—	50 "	12.00
1 1/2"	25 "	15.00
—	35 "	10.00
—	50 "	14.00
—	—	20.00

I.D. Size	Length	per Length	Couplings
1/2"	25 feet	\$5.00	\$1.50 Pair
—	50 "	10.00	1.50 "
3/4"	25 "	6.25	2.50 "
1"	50 "	12.50	2.50 "
—	25 "	10.00	3.50 "
—	50 "	20.00	3.50 "

LARGER SIZES ALSO AVAILABLE
All Prices—Net—F.O.B. New York

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★ MINING EQUIPMENT READY FOR DELIVERY ★

CUTTING MACHINES—250 VOLT

- 2-13-AB Goodman Shortwalls, 35-HP.
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- 2-CE-7 Sullivan Shortwalls

LOCOMOTIVES—250 VOLT

- 1-4-Ton G.E. 825, low vein with cable reel
- 1-6-Ton Ironton, low vein with cable reel
- 1-8-Ton G.E. 822 haulage
- 1-10-Ton Jeffrey M.H.-78 new throughout except units, 3" Armor plate frame
- 1-13-Ton Westinghouse, Type 79

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- 1-200-KW West. 2200 volt Sync. Motor, 250 volt generator, complete with switchboard.
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Goodman #212 Low Vein with A.C. Motor

3-Goodman 12E Short Wall with D.C. Motors

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RUBBER CONVEYOR BELTS:

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TANKS:

12,000 and 15,000 gal. and 20,000 gal.

CONVEYOR PARTS:

Idlers, Heads & Tail Pulleys, Steel Frames, Tripers, etc., 14 In., 60 In. Large stock here.

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100 KW Ridgway 1200 RPM 3/60/2300/250-275

150 KW G.E. 1200 RPM 3/60/2200-250-275

200 KW Ridgway 900 RPM 3/60/2200-250-275

3-100 KW G.E. 275 v. 1200 RPM Rotaries

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2 1/2 ton Witcomb 24 ga. New Batteries

2-4 ton G.E. 30 in. ga.

3-5 ton Manches 30 in. ga.

4-5 ton G.E. 36 in. ga.

3-7 ton Goodman 36 ga. Battery & Trolley

8-6 ton Baldwin Westing. 42 ga. & 36 ga.

TRACK SCALE:

150 Ton Buffalo 56 ft. R.R. Track Scale

TROLLEY LOCOMOTIVES:

2 1/2 ton Westinghouse 24 ga.

4-6 ton & 3-7 ton Goodman 30 ga.

3-6 ton Goodman 42 ga.

5-6 ton Westinghouse 42 ga.

2-8 ton Goodman 36 ga.

10 ton Goodman 42 ga. & 13 ton Jeffrey

VIBRATING SCREENS:

9 Tyler Hummer 3x6, 4x5, 4x8 & 4x10

2 Robin Gyrex 4x8 $\frac{1}{2}$

4x12 Niagara, 3x8 L. B., 5x6 Simplex

CARS:

60-Western 16-20-30 yd. Side Dump

SHOVELS, CRANES & DRAGLINES:

3 W 90' Boom, 6 & 160' Boom, Model 6150, 175' Boom, Diesel, Monaghan Walkers

1 yd. K 30 Link Belt 50' Boom Crane

2 yd. Page 70' Boom Diesel Dragline

1 1/2 yd. Marion 450 Elec. Shovel

1 1/2 yd. Lima Diesel Shovel & Dragline

2 yd. Link Belt Elec. Shovel & Dragline

25 ton Browning 50' Boom Loco. Crane

MINE LOADERS:

Junior 30 ga. Low Pan

Conway 20 ga. High Pan

3-5 BU & 7 BU 36 or 42 ga. Joy

9-Goodman 200 & Jeffrey 441

7 Conway 20A, 30A, 50A, 60 & 75 Muckers

MISCELLANEOUS:

15 Ton Plymouth 36 ga. Diesel Locomotive 5'x160' Plymouth Rotary Dryer

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9x8 Sullivan Mine Compressors

Clamshell Buckets 3/4; 1, 1 1/4 & 2 yd. Cap.

30 ton & 12 ton Vulcan St. Ga. Gas. Loco.

WANTED TO BUY:

Complete Mines—M.G. Sets, Locomotives, Compressors, Conveyors, Cranes, Crushers & Rotary Converters. Also Bails, Screens, Pumps, Cars, Mine Loaders & Mining Machines.

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60 East 42nd St. New York, N.Y.

NEW and REBUILT STORAGE BATTERY

LOCOMOTIVES

1 1/2 to 10 Ton — 18" to 56" Track Gauge

GREENSBURG MACHINE CO.

Greensburg, Penna.

REBUILT EQUIPMENT—READY TO SHIP

AIR COMPRESSORS

1—599 cfm. Ingersoll-Rand, 100# pres., Imperial 10, type XB-2, horiz., two stage Duplex, double acting, size 16x14x10x14", complete with 104 HP, 220/440 v., 3 ph., 60 cy. AC motor, complete.
1—888 cfm. Ingersoll-Rand, 100# pres., Imperial 10, type XB-2, horiz., two stage Duplex, double acting, size 19x16x12x16", complete with 150 HP, 220/440 v., 3 ph., 60 cy. AC motor, complete.

MINING MACHINES—250 v. DC

1—CE-7 Sullivan 36" gauge

2—7 A.U. Sullivan Track Mt'd. 550 v. DC

2—Sullivan 5B Buddy Mining Machines 230 v. DC 5' bar, 2½" kerf.

2—Armatures for CE-7 Sullivan 250 v. DC.

MINE LOCOMOTIVES

1—3½ ton Ironton Battery 36" ga.

1—6 ton Atlas 4000# D.B.P. with AC or DC Motors 36" ga.

1—10 ton Milwaukee Gasoline

1—12 ton G.E.-52 500/550 v. 42" ga.

ROTARY CONVERTERS

2—400 kw. G.E. 250 V. D.C. 600 rpm., 2300 v. A.C. complete

COAL DRILL

1—Little Giant Chicago Pneu. Tool Co., style 473, 220 v., 3 ph., 60 cy., type PM, spec. R867-S1212.

HOISTS

100 HP, Lidgerwood 2 drum AC or DC Motor

CENTRIFUGAL PUMPS

2—1000 G.P.M. Cameron bronze, 100' hd. 8 x 8

1—800 G.P.M. Weinman 90' hd. 6 x 5

2—160 G.P.M. Deming Triplex 150# 335' hd. 6 x 8

TRANSFORMERS—1 ph. 60 cy.

No.	Kva.	Pri.	Sec.	Make
1	250	2300	460	G.E.
1	100	2200	110/220	G.E.
3	100	6600	550/440/220	Pgh.
3	50	11430/6600	550	Al. Ch.
3	50	6600	575	G.E.
1	37½	2300	220/440	Wagner
3	37	4400	185	West. (Rotary)
35	10	2200	110/220	G.E.
100	7½	2200	110/220	G.E.
75	5	2200	110/220	West.

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
400	Westg.	CW	440/220	1170
300	Westg.	CW-1106	2200	580
250	Westg.	CW	2200	345
100	G.E.	I	220	450
100	Westg.	CI	220/440	1750
75	Cr. Wh.		220/440	875
60	Triumph	C-16	220/440	430
60	Westg.	HF	2200	690
53	G.E.	I	220/550	1165

SCALES

9—Howe No. 2734, 3 beams (2 at 200 lbs.—1 at 50 lbs.) Platform 14½ x 22", cap. 500#

DIESEL ENGINE SET

1—217 KVA G.E. 2300/220/440 v. 3 ph. 60 cy. rpm, dir. con. to 260 HP Buckeye horiz. 2 cyl. Diesel.

DIESEL ENGINE GENERATOR SET
1—75 KW, 250 v. DC, type SK Westg. Gen. belted to 100 HP Buckeye Horiz. Diesel Engine, complete with swb.

230 V. DC MOTORS

HP	Make	RPM	Type
30	Westg.	1150	SK-110L
35	Westg.	675	SK-140
125	Morg. Gardner	425	—
	G.E.	500	MPC-6
150	Cr. Wheeler	625	CCD
200	Cr. Wh.	477	CCD
250	Cr. Wheeler	200/400	CMC
300	Otis	550	—

(With spare armature)

MOTOR GENERATOR SETS

150 Crocker Wheeler 250 v. D.C. 600 rpm., 200/440 or 2300 v. Syn. Motor

125 kw. Crocker Wheeler 250 V. D.C. 1200 rpm., 220/440 v. 3 ph. 60 cy. Ind. Motor

DUQUESNE ELECTRIC & MFG. . . . PITTSBURGH (6), PA.

ROTARY CONVERTERS

500 KW G.E. SYN. 275 V. 6 Ph. 60 Cy. 1200

RPM. Pedestal Type, 2300/4000 V. Transformers.

500 KW AL-CH SYN. 275 V. 60 Ph., 60 Cy., 1200

RPM. Pedestal Type, 2300/4000 V. Transformers.

500 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200

RPM. Pedestal Type, 2300/4000 V. Transformers.

300 KW G.E. SYN. 575 V. HCC. 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.

200 KW G.E. SYN. 275 V. 6 Ph., 60 Cy., 1200

RPM. Bracket Type, 2300/4000 V. Transformers.

200 KW AL-CH SYN. 275 V. 6 Ph., 60 Cy., 1200

RPM. Pedestal Type, 2300/4000 V. Transformers.

150 KW G.E. SYN. 275 V. HCC. 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.

MOTOR GENERATORS

300 KW RIDGEWAY SYN. 275 V., 440/2300/4000

V., 3 Ph., 60 Cy., 720 RPM. Manual Switchgear.

200 KW G.E. SYN. 275 V., 2300/4000 V., 3 Ph.,

60 Cy., 1200 RPM. Manual Switchgear.

200 KW R.W. SYN. 275 V., 2300/4000 V., 3 Ph.,

60 Cy., 900 RPM, 80% P.F. Manual Switchgear.

LOCOMOTIVES

13-T WESTGHE, 250 V., 908-C Mts., 36"-36" Ga.

10-T WESTGHE, 250 V., 907-C Mts., 36"-44" Ga.

10-T WESTGHE, 500 V., 907-C Mts., 36"-44" Ga.

9-T WESTGHE, 250 V., 906-C Mts., 36"-44" Ga.

8-T WESTGHE, 500 V., 906-C Mts., 36"-44" Ga.

8-T GOODMAN, 250 V., 132-A Mts., 36"-44" Ga.

6-T WESTGHE, 250 V., 904-C Mts., 36"-44" Ga.

4-T WESTGHE, 250 V., 902-C Mts., 36" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

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Incorporated

501 Grant Building Pittsburgh, Pa.

MINE HOISTS

1—Ottumwa 18" Band friction will coil 2000 ft. 3/4" rope 35 or 50 HP motor.

1—Vulcan 30" Band friction will coil 3000 3/4" rope 50 or 60 HP motor.

1—Connellsville 54" Band friction will coil 5000 ft. 7/8" rope 100 or 150 HP motor.

1—Lidgerwood 60" Band friction will coil 6500 ft. 1 1/8" rope with 200 to 350 HP motor.

1—Vulcan 60" Sliding pinion will coil 3500 ft. 1 1/8" rope. 200 HP motor.

1—Lidgerwood-Cylindro Conical Shaft Hoist—225 ft. 1 1/4" rope. 300 HP motor.

1—Vulcan-Cylindro Conical Shaft Hoist 350' 1 1/8" rope. 400 HP motor.

1—Connellsville-Cylindro Conical Shaft Hoist 350' 1 1/2" rope. 800 HP motor.

And other hoists to suit all mining conditions

Jones Mining Equipment Co.

541 Wood Street Pittsburgh, Pa.

FOR SALE

1—One NORDBERG Hoist No. 06392, 4 ft. drum, hydraulic brake direct connected 150 h.p., G.E. motor AC, 440 v. 3 ph. 60 cycle, speed 585, complete with panel board and ammeter.

3—One POMONA Vertical Pump, 75 h.p., AC, 250 v. 60 cy. 3 ph. Westinghouse motor, together with starting compensator, capacity 1000 gal. per min., 200 feet head.

4—One ALLIS CHALMERS Pump, type BS 13406, 100 h.p., motor AC, 220 v. 60 cy., 3 ph., capacity 1000 gal. per min., 250 feet head.

All of the above equipment in first class operating condition

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520 No. Michigan Ave., Chicago, Ill.

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for

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CARS — CRANES — COMPRESSORS

DRAGLINES — LOCOMOTIVES

SHOVELS — TRACTORS — ETC.

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WE WILL FIGURE WITH YOU ON

YOUR SURPLUS

B. M. WEISS CO.

Girard Trust Bldg. Phila. Pa.

LOCOMOTIVES

1—American 41 ton, 4 wheel, saddle tank Locomotive, electric lights, steam brakes, ASME boiler, 190 lbs. Sale or rent.

1—Lima 80 ton, six wheel, Switcher with tender, National Board boiler, 200 lbs. working pressure, super heater, automatic lubrication; excellent condition, immediate delivery.

1—American 68 ton, 6 wheel, Switcher with tender, electric lights, air brakes, power reverse; overhauled.

1—Whitcomb 6 ton, 36" gauge, gasoline driven Locomotive, electric lights, starter, etc.

CARS

8—20 yd. capacity, K & J, all steel, air dump Cars, lift type doors, cast steel side truck frames, air brakes, air dump.

CRAWLER CRANE

1—General ½ yd. crawler tread with ½ yd. Blow Knox clam shell bucket, powered with Buda diesel motor.

OVERHEAD CRANE

1—Shepard 7½ ton, 36 ft. span, 220 volt, D.C., bucket operating.

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MINING MACHINES

2-12 G3 Goodman 220/3/60 AC 6' bar.
2-12 AB Goodman 250 v. DC 6' bar.
1-35 Jeffrey Low Vein Machine DC Mcne. 36" Ga.

STORAGE BATTERY LOCOMOTIVES

2-6 Ton G. E., Permissible Type LSBE Class 2C6 Form C 9 with 2 HM 825 Ball Bearing Motors 1½" armoplite frame 44" Ga. (Can change to 36" Ga. or less) 1—Locomotive equipped with Gould Lead Battery 12 months of original guarantee. 3 Locomotives equipped with Edison Batteries with as much as 72 months in original guarantee. Length 13½" long, 50" high, 69" wide and 44" Wheel Base. (Can furnish 150 KW G.E. Syn. M.G. Set, 2200 v. 3 ph., 60 cy. 1200 RPM to charge above batteries.)

3-5 Ton Type D Ironton, 36 or 44" Ga.

1-4 Ton Jeffrey 44" Ga. with Batteries.

4 Ton General Electric, 36" Ga.

1-5½ Ton Jeffrey 36" Ga. with 48 cell 23 plate New Exide Ironclad Battery

(Haulage)

10 Ton Jeffrey 250 v. 36/42" Ga. MH 110.

10 Ton Westinghouse 250 V. 36" or 40" Ga.

8 Ton Westinghouse 250 V. 42" Ga.

2-5 Ton West. 250 V. 36 or 42" Ga./with Electric Gathering Reels. Bar steel frame.

SCREENS

2-4' x 5' single deck Tyler Hummer Screens Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

MG SETS 3 ph. 60 cy. (Syn.)

150 KW Ridgway 250 V. DC 2200 V. AC 900 RPM.
100 KW Ridgway 250 V. DC—2200 V. AC 1200 RPM.
125 KW Cr. Wh. 250 V. DC—2200 V. AC
30 KW West. 250 V. DC—220 V. AC 1150 RPM.
22½ KW Al. Ch. 125 V. DC—2200 V. AC 900 RPM.

AIR COMPRESSORS

492 cu. ft. 100 #C hg. Pneumatic straight line heavy duty Diesel oil driven Compressor unit.

ENGINE GENERATOR SETS

100 KW 250 V. DC Westinghouse—Skinner Engine.
50 KW West. 125 V. DC—Skinner Engine.

25 KW Westinghouse 125 V. Steam Turbine.

OIL ENGINE GENERATOR SETS

75 KW G. E. 125 v. DC V Belted to 100 HP Cooper Bessemer 2 cyl. hor. Oil Engine.

Can substitute a 250 v. Generator or a suitable AC Generator of the proper specifications

SLIP RING & SQ. CG MOTORS

(3 ph. 60 cy.)

HP	Make	Speed	Wdg.	Type
200	G.E.	250	S.R.	MT 412
200	G.E.	600	S.R.	I-M
150	Al. Ch.	685	S.R.	
150	G.E.	600	S.R.	IM
125	Al. Ch.	435	S.R.	
100	G.E.	500	S.R.	MI-25 cy.
100	Al. Ch.	575	S.R.	

5 TRACK STEEL TIPPLE

Consisting of large shaker screen, 3 loading booms and picking table, 5 car retarders, 20 inch, 36 inch and 48 inch belt conveyors, crusher, 3 bins for domestic coal, 6 transformers, large number of 220 volt, 3 phase, 60 cycle motors, with gear reducers. Also air cleaning plant, including large blower with 200 HP Syn. motor. Entire tipple in place exactly as when last operated.

PUMPS

250 GPM 250# or 575' Head 2 cyl. Hor. National Transit 6" suc. 4" dis. enclosed driven by 40 HP Motor.

HOISTS

1500 HP Shot hoist including flywheel MG set operated on 2200 volt 3 phase 60 cycle

75 HP Lidgerwood sgl. fr. drum

50 HP Diamond 2 drums same shaft

52 HP American 2 drum, AC Motor

30 HP Clyde sgl. drum, AC Motor

30 HP Double drum—Tandem

15 HP Lidgerwood sgl. dr. AC Motor

400 TRANSFORMERS

(Westinghouse & GE 1 ph.)

Qu.	KVA	Pri. V.	Sec. V.
40	5	2080/2200	115/230
31	7½	—	—
28	10	—	—
12	25	2200	244/488
3	37 Rotar.	4400/185	115/230
3	37½	2200	220/440
3	50	22000	2200
3	75	2200	110/220

AC AIR BREAKERS (unused)

8-200/400 amp. 3 pole ITE 220 v.

2-300/600 amp. 3 pole ITE 220 v.

12 BU JOY JR. LOADER

Equipped for 220/3/60. Factory rebuilt. Will work in 3' Coal, average 1½ tons per minute.

MOORHEAD-REITMEYER CO., INC.
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150-COAL HOPPER CARS

50-Ton Twin hopper or side discharge—1,683 and 1,831 cubic feet capacities.

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PITTSBURGH NEW YORK CHICAGO

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AC & DC

REBUILT & GUARANTEED

FOR IMMEDIATE

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SEARCHLIGHT SECTION

LOCOMOTIVES

Goodman: All 250 volts.
 1—10 ton, 31-1-4-T.
 1—6 ton, 30B, 48" 1—5 ton.
 1—5 ton, W-1-2, 36".
 1—5 ton, 10-30.
 2—4 ton, 2600 K.
 1—6 ton, 33-1-4-T.

Westinghouse: All 250 volt.
 1—4 ton, 902, 48" 1—18 ton, 102, 42"
 1—904 c. 44" 500 volt. Also 906 motors.
 1—10 ton, 915.

G.E.: All 250 volt. 4 ton 1022, 41, as is
 6 ton 803, 44", as is 5 ton 825, 44"
 6 ton 823, 44" 8 ton 839 motors
 6 ton 801
 8 ton 839

Jeffrey: 6 ton, and 4 ton, all gauges, 250 volt
 1—Jeffrey MH 110 Locomotives
 1—Jeffrey MH 100

AERIAL TRAMWAYS * HOISTS * PUMPS * MOTORS * TRANSFORMERS * BOND WELDERS * RESISTANCE * COMPRESSORS * DUMPS * SPEED REDUCERS * FIELD FRAMES * ARMATURES * GOODMAN HYDRAULIC SHOVELS * MOTOR STARTERS AND CONTROLLERS (Goose-neck), 25B and 29C * MINING MACHINE TRUCKS * SWITCHBOARDS * CIRCUIT BREAKERS—AC & DC * CONVEYOR HOISTS * COAL CRUSHERS (double roll) 12" x 16", single roll 24" x 36", 36" x 36" CONVEYOR HOISTS, 24" x 24" and 18" x 16" * TURBO-GENERATOR 500 K.W. 275 volt DC * ROPE & BUTTON CONVEYOR 400' long LATHE, SHAPERS * SWITCHES * AUTOMATIC CIRCUIT BREAKERS 250 volt 600 amps to 2000 amps * MANUAL CIRCUIT BREAKERS 600 amps to 3000 amps * HOISTS, overhead, AC, 3-60-440, 1 ton and 2 ton CAR RETARDERS, Fairmont * I Clam shell bucket 1 1/2 cubic yard, I—Figure 8 drum * MINE CARS 22" high, 44" gauge * 2 SULLIVAN BIT SHARPENERS * R.R. SWITCHES 85# to 100# HOISTS 5 HP AC and DC. GENERATORS DC 250-275 volt, 30 KW to 100 KW. Also 50 KW 125 volt direct connected to steam engine.

MINING MACHINES

Jeffrey: 35B, 29B, and 4—28A, 250 V.
Goodman: 12A, 12AB, 12AA, 12G3A, 34B.
 1—12G3 250 volt and 2—112 DA, 500 volt.
 2—Permissible Type 12CA. 6—112AA,
 3—124AA.

Sullivan: CE7, CE9, CE10, CR10 Low Vein.

SUBSTATIONS—275 volts, D. C.

2—200 KW G.E. Rotaries (600 volt)
 1—200 KW Ridgeway M.G. Set.
 1—200 KW G.E. Rotary Converter.
 1—200 KW West. Rotary.
 1—150 KW West. Rotary.
 1—200 KW 1—100 K Ridgeway M-G Sets.
 1—150 KW Ridgeway Rotary.
 1—150 KW West. Rotary converter.
 1—100 KW West. M-G Sets
 1—90 KW G.E. Rotary.

GUYAN MACHINERY COMPANY, Logan, W. Va.

CURRENT SPECIALS

Two—Ironton type WOD double motored 42" qa combination battery-trolley locomotives (without batteries), GE 80 volt ball bearing motors, worm & worm gear drive, ball bearing trucks. Good used condition. Price subject inspection and prior sale, \$1125.00 each.

Two—150 H.P. Brownell boilers. Fire tube 6 x 20 approved for 110 lbs., subject inspection and prior sale \$750.00 each.

One—Sullivan C67 mining machine, 3-60-220 volt, tip turn truck, cable etc.—Subject inspection and prior sale, \$1050.00.

One—100 KW Allis-Chalmers rotary converter, with three 40 KVA transformers, HV 6900 LV 185-92.5. As is, subject inspection and prior sale, \$1350.00.

Two—562 KW Allis-Chalmers turbo-generators, 3 phase 60 cycle 2300 volt, complete with condensers, piping, valves, wiring and switchboards. Price \$10,000.00 per unit, subject inspection and prior sale.

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Office and Warehouse
 Reed and Election Streets
 BENTON, ILLINOIS
 Complete Catalog on Request

COMPRESSORS

300 CFM Chi. Pneu. with 75 H.P. motor
 526 CFM Ingersoll-Rand, Style "JC"
 599 CFM Ingersoll-Rand Type 10XB horiz. 2-st.
 100# W. P., 150 H.P. 3/60/440 V motor and
 starter, etc.
 888 CFM Ingersoll-Rand Type 10XB horiz. 2-st.
 100# W. P., 75 H.P. 3/60/440 V motor and
 starter, etc.
 940 CFM Ingersoll-Rand 10 horiz. 2-st. steam driven with receiver

CRUSHERS

24" x 54" Superior Crushing Rolls
 #3 McCully Gyratory
 #6 McCully Gyratory

HOISTS

8—American Hoist & Derrick Co. double drum, motor driven with 40 H.P. A.C. motors

MOTORS

125 H.P. G. E. Type I-12-125A, 600 RPM, complete with controller, etc.
 150 H.P. Allis Chalmers, 695 RPM, complete with controller, etc.

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Some Steam Engines and Boilers available only slightly above the metal price

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Near Toledo

COAL CUTTING MACHINES

1—35B Jeffrey 250 volt Shortwall
 1—35B Jeffrey 500 volt Shortwall
 1—29LE Jeffrey T.O.H. Arcwall Permissible
 1—12DA Goodman, 50 HP, 210 volt
 1—12A Goodman, 500 volt Shortwall
 1—12G3 Goodman AC Shortwall, 3/60/220-440 volt

LOCOMOTIVES

1—13 ton G.E. with HM-829 250 V Motors
 1—10 ton G.E. with HM-830 250 V Motors
 2—6 ton Jeffrey with HM-88 250 V Motors, and reels
 1—6 ton G.E. with HM-819 250 V Motors

ELECTRIC MOTORS, ETC.

1—165 HP G.E. Syn. Motor, 3/60/2200 or 500 V, 900 RPM
 1—100 HP Crocker Wheeler Syn. Motor, 3/60/220 V, 1200 RPM
 2—50 HP G.E. Slip Ring Motors, 3/60/440 V, 600 RPM
 1—100 HP West. Type CW Slip Ring Hoist Motor, 3/60/2200 V, 720 RPM
 3—150 KVA Pittsburgh Transformers, 6600-220/440 V
 3—100 KVA G.E. Transformers, 13,200/6600-2200-220/440 V
 3—30 KVA West. 2200-110/220 V
 1—25 HP West. Type HK, 250 V, Series Wound Hoist Motor, 600 RPM

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Slip ring, 125 H.P., F.M., 3 Ph., 60 Cy., 440 V., B/B, 1750 RPM; with drum type controller and resistance. Very attractive price.

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Warehouse: Carnegie, Pa.

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100 Kw Gen. Elec. Rotary 250/2300 V 6600, 2200 & 440 Volt Transformers
 24" x 20" Jeffrey 2 Roll Coke Crusher
 18" x 30" McLanahan Coal Crusher
 50 Hp Lidgerwood Double Drum Hoist
 R113 Mine Locomotive Controllers
 270 GPM Synch. Mtr. Driven Pumps
 600 GPM D.C. Mtr. Deep Well Pumps
 350 HP 3/60/2200 V Weco S.R. Motor
 250 Hp 3/60/2200 V Weco S.R. Motor
 200 Hp 3/60/2200 V Geco S.R. Motor

Large Stock—A.C. & D.C. Motors
 Switchboards Built to Order

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FORMERLY THE PENCOYD IRON WORKS

NORTH PHILADELPHIA, PA.

OVERHEAD CRANES

Quan.	Cap.	Make	Current	Span	Cont.
3	2½ Ton	American Bridge	D.C.	21'	Fl.
1	5 Ton	Yale & Towne	D.C.	35'	Cg
3	5 Ton	Morgan	D.C.	13'	Fl.
1	6 Ton	Yale & Towne	D.C.	47'	Cg
1	6 Ton	Alliance	D.C.	63'5"	Cg
1	6 Ton	American Bridge	D.C.	63'5"	Cg
1	6 Ton	Yale & Towne	D.C.	63'5"	Cg
3	6 Ton	Sellers	D.C.	63'5"	Cg
1	10 Ton	Whiting	D.C.	43'	Cg
1	10 Ton	P. & H.	D.C.	47'	Cg
*1	10 Ton	Morgan	D.C.	58'	Cg
*1	10 Ton	Sellers	D.C.	58'	Cg
1	10 Ton	Case	D.C.	95'	Cg
1	10 Ton	American Bridge	D.C.	95'	Cg
1	12½ Ton	P. & H.	D.C.	35'	Cg
1	15 Ton	Sellers	D.C.	75'	Cg
1	15 Ton	P. & H.	D.C.	60'	Cg
1	15 Ton	Sellers	D.C.	35'	Cg
1	15 Ton	Sellers	D.C.	57'	Cg
1	15 Ton	P. & H.	D.C.	28'4"	Cg
1	20 Ton	Morgan	D.C.	42'	Cg
1	20 Ton	Sellers	D.C.	36'	Cg
1	25 Ton	Sellers	D.C.	58'3"	Cg
1	25 Ton	American Bridge	D.C.	35'	Cg
1	25 Ton	P. & H.	D.C.	28'4"	Cg
1	40 Ton	Yale & Towne	D.C.	39'5"	Cg
3	80 Ton	American Bridge	D.C.	40'6"	Cg

* Have dual operating controls, full rotating lifting tongs and 5 Ton Aux. Hoist.

STEEL BUILDINGS

- 1—Hip Roof Const. 100' Wide 650' long—Cranes available
- 1—Hip Roof Const. 60' Wide 135' long—25 T Crane & Runway
- 1—Hip Roof Const. 40' Wide 270' long—5 T Crane & Runway
- 50—Other Buildings, all steel frame, various dimensions.

STEAM TURBINES

- 1—1500 KW-Gen. Elec. 230 volt D.C. Surface Condensers, Panel Boards, Pumps & Accessories, Dual Steam connections for high or low pressure.
- 2—1000 KW-Gen. Elec. 230 volt D.C. Surface Condensers, Panel Boards, Pumps & Accessories, Dual Steam connections for high or low pressure.

LOCOMOTIVE CRANES

- 1—Orton & Steinbrenner Standard Gauge, Steam Driven
- 1—Browning Standard Gauge, Steam Driven

BOILERS

- 5—588 H.P. Babcock & Wilcox Water Tube with Superheaters and all accessories. Built for 250# pressure
- One with Riley—6 Retort Underfeed Stoker. Four with Taylor—6 Retort Underfeed Stokers
- 10—246 H.P. Babcock & Wilcox Water Tube, Horizontal, Cross Drum, Waste Heat Boilers with all accessories. Built for 250# pressure.

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For Details and Full Information Send Inquiries to M. A. RIDDLE

C/O **CARNEGIE ILLINOIS STEEL CORP.**

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TELEPHONE — CYNWYD-3100

PUMPS & COMPRESSORS

- 100—Pumps, various sizes from small reciprocating to 12,000 G.P.M. Centrifugal with 500 H.P. D.C. Motor.
- 3—Laidlaw Dunn Gordon, Steam Driven, Feather Valve Air Compressors, equipped with Intercoolers, safety stops and all fittings and accessories. 2400 cu. ft. free air per minute at 100# pressure.
- 1—Snow Hydraulic Pump, 850 G.P.M. against 600 lbs. pressure, accessories and accumulators.

CARS & LOCOMOTIVES

- 350—All Steel Cars, 36" Ga. Journal Box Bearings, 18" Wheels
- 8—Dinky—Saddle Tank Locomotives, 36" Ga.
- 1—50 Ton Stan. Ga. Baldwin, Saddle Tank.
- 1—70 Ton Stan. Ga. Baldwin, with Tender.

MOTORS & CONTROLS

- 300—230 Volt D.C. Motors 1 H.P. to 500 H.P. Crane Motors, Pump Motors, etc. with Controls of every description.
- 1—200 Amp. Westinghouse Portable Arc Welder
- 1—400 Amp. Lincoln Portable Arc Welder

MAGNETS

- 7—Electric Magnets, Ohio Elec., E. C. & M. and Cutler Hammer
- 3—65", 2—52", 1—45" and 1—39"

MACHINERY & TOOLS

- 3—Pipe Machines 12"—8" and 4", 26" x 16' Quick Change, M.D. Niles Lathe, 32" Stockbridge Shaper, Drill Presses, Misc. Tools and shop supplies.

STEEL STACKS

- 9—Self Supporting Steel Stacks
- 3—Inside Dia. of Shell 57" Height 101'
- 1—Inside Dia. of Shell 57" Height 115'
- 1—Inside Dia. of Shell 57" Height 125'
- 1—Inside Dia. of Shell 72" Height 126'6"
- 2—Inside Dia. of Shell 72" Height 125'
- 1—Inside Dia. of Shell 120" Height 153'6"

MISCELLANEOUS

- 8000 Tons Structural Steel Sections, Beams, Angles, Channels and Plates, 1000 Tons Pipe and Valves Copper Wire #10 to 1,000,000 C.M., 5000 Squares of Corrugated Sheets, 2000 Tons Rail 40# to 85#, Jib Cranes, Plate and Alligator Shears, Coal Bunkers, Blowers, Gears and Pinions, Tanks all sizes and misl. plant supplies of all kinds.

COAL AGE ADVERTISERS IN THIS ISSUE

An asterisk preceding manufacturer's name indicates detailed information may be found in the 1943 COAL MINING CATALOGS, where † appears after a company's name advertisement does not appear in this issue, but was in preceding issues.

Ahlberg Bearing Co.	140	Electric Storage Battery Co.	73	McLanahan & Stone Corp.	144	Walter Motor Truck Co.	28
Allen & Garcia Co.	25	Ensign-Bickford Co.	44	*McNally-Pittsburg Mfg. Co.	†	Wellman Co., S. K.	†
*Allis-Chalmers Mfg. Co.	38, 39			*Merrick Scale Mfg. Co.	†	Westinghouse Air Brake Co., Ind. Div.	†
*American Brattice Cloth Corp.	†			*Metal & Thermit Corp.	127	*Westinghouse Elec. & Mfg. Co.	23
*American Cable Div. of American Chain & Cable Co.	Third Cover	Fairbanks Co.	†	Mine Safety Appliances Co.	†	*W. Va. Steel & Mfg. Co.	132
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The fine performance of this plant led them to again select Link-Belt to design and build the plant illustrated above, for preparing the output of two mines in the same seam at Sunnyside. Some of this coal will go to the by-product coke ovens at the steel mill of Kaiser Co., Inc., located at Fontana, California, some will be coked at

Sunnyside and the balance prepared for domestic, commercial and steam markets.

The overall capacity of the plant is 380 tons of r.o.m. per hour, with washing (Link-Belt air pulsated washer) provided to the extent of 250 t.p.h. of minus 3", which will be classified after cleaning, into a number of sizes.

Two rotary dumpers set over a common hopper can handle coal from the two mines simultaneously or separately, as desired. A Link-Belt crusher below the hopper reduces the raw coal to 6" and below, before going to the preparation plant where facilities are provided for cleaning, drying, sizing, blending and loading.

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